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The Relationship between Parent Participation and Student Success in a Long-term Weight Loss Immersion Program

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The Relationship between Parent Participation and Student Success in a Long-term
Weight Loss Immersion Program

By
Susan Mary Trotter Borgman

A Dissertation Submitted to the
Gardner-Webb University School of Education
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Education

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2013

Approval Page

This dissertation was submitted by Susan Mary Trotter Borgman under the direction of the persons listed below. It was submitted to the Gardner-Webb University School of Education and approved in partial fulfillment of the requirements for the degree of Doctor of Education at Gardner-Webb University.

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Abstract

This study focused on the relationship between student success in a long-term weight loss immersion treatment program and parent participation in the program; parent participation is defined as engaging in similar healthy behaviors at home while their child is in the program including (1) parents also striving to achieve or maintain a healthy weight; (2) parents self-monitoring of weight loss behaviors/healthy habits; (3) parents reducing/eliminating high fat foods in the home and increasing nonfat/low fat foods in the home; (4) parents improving family support in the home; and (5) parents facilitating healthy family functioning in the home.

The problem addressed in this study was that parents struggle to understand and embrace their significant role in their children's weight loss process; issues included parent lack of awareness of the epidemic of obesity or the health dangers related to it, challenges in knowing what to do if their child is obese, and a tendency to demonstrate a lack of motivation to change their own behavior.

This study used a quantitative correlational design with a pretest/posttest and an intervention that was completed over a 10- to 16-week time period from August 20, 2012, to December 8, 2012; recruitment of subjects began in mid-July 2012. The pretest was conducted when parents and their children arrived at the program; the posttest was done at the conclusion of the study in November and December. In October at the midway point when the parents attended the mini-immersion parent workshop, each of the measures taken in the pretest and posttest were taken again to strengthen statistical power. The pretest and posttest consisted of both parent and child independently completing (1) the weigh in, (2) height measurement to calculate BMI, (3) the food checklist (see Appendix A), (4) the social support survey (see Appendices B and C), and (5) the family survey (GF) (see Appendix D). Parent self-monitoring was also measured at the mini-immersion parent workshop in October and at the end of the study in November and December.

The results indicated no correlation between parent participation and student success due to a very small sample size; only eight families participated because of low enrollment at the facilities used in the study. However, this study did confirm the value of exploring the impact of parent behavior on student success, especially in regard to how parents can modify their behavior (weight loss and self-monitoring) and how parents can modify the home environment (food available in the home, parental support at home, and facilitation of healthy family functioning) to empower their children to achieve a healthy weight.

Table of Contents

	Page
Chapter 1: Introduction	1
Problem Statement	9
Purpose and Significance	13
Definition of Terms	14
Overview of Methodology	16
Limitations and Delimitations	22
Organization of the Dissertation	24
Chapter 2: Literature Review	26
Introduction	26
Themes in the Literature	28
Conceptual Framework	45
Research Questions	52
Summary	56
Chapter 3: Methodology	58
Introduction	58
Research Design	65
Research Sample/Participants	67
Instruments and Procedures	71
Data Collection	77
Data Analysis	78
Role of the Researcher	80
Limitations and Delimitations	86
Summary	90
Chapter 4: Results	91
Introduction	91
Changes to Timeline	92
Changes to Data Collection	93
Results for Each Research Question	93
Summary	111
Chapter 5: Discussion	115
Summary of the Study	115
Discussion	117
Implications for Practice	127
Recommendations for Future Research	130
Concluding Statement	132
References	133
Appendices	
A Food Checklist	142
B Social Support Survey (Parent Version)	144
C Social Support Survey (Student Version)	147
D Family Survey	150
E Self-Monitoring Evaluation Tool	152

Tables

1	Demographics and Initial and Final Weight and BMI Data for Parents and Students.....	95
2	Rankings of Parents and Children Based on BMI Change for Spearman rho	97
3	Parent Use of Self-Monitoring Journal (SMJ) with Parent and Child Weight Loss	101
4	Results of Initial, Midpoint and Final Food Checklist Survey Completed by Parents and Children Separately	103
5	Results of Social Support Survey where Patterns were Noted in Encouragement by Family and Participation in Exercise Together as a Family	106
6	Family Support Survey Results Including Initial BMI, Weight Loss and BMI Change.....	110

Figures

1	Kirschenbaum's Stages of Change in Successful Weight Control	49
2	Scatterplot of Spearman Rank Correlation for Five Families with y axis Representing Students and x axis Representing Parents.....	98

Chapter 1: Introduction

Focus. Two thirds of the population of the United States is overweight or obese according to the Centers for Disease Control and Prevention (Centers for Disease Control and Prevention [CDC], 2012). Children and adolescents are experiencing significant physical, mental, emotional, and social health issues as a result of the obesity epidemic. Serious medical and social problems include “high blood pressure, adverse lipoprotein profiles, diabetes mellitus, atherosclerotic cerebrovascular disease, coronary heart disease, colorectal cancer, and death from all causes, as well as lower educational attainment and higher rates of poverty” (Stice, Presnell, Shaw, & Rhode, 2005, p. 195). Obesity in adolescents is also a predictor of adult obesity and a significant factor in low self-esteem (Jelalian, Mehlenbeck, Lloyd-Richardson, Birmaher, & Wing, 2006; Tsiros, Sinn, Coates, Howe, & Buckley, 2008; Vignolo et al., 2008). Obesity has become a global public health problem with rates of overweight or obesity tripling since 1980 in the European Union and increasing steadily around the world including in developing countries (Delgado-Noguera, Tort, Bonfill, Gich, & Alonso-Coello, 2009).

The Surgeon General of the United States has estimated the total cost of overweight and obesity in the United States in 2000 at nearly 10% of the US health care expenditures. This is more than 12 times the yearly cost of HIV/AIDS prevention and care in Africa, Asia and Latin America. (Hughes, Areghan & Knight, 2005, p. 72)

Significance. A review of the research indicates that there is a significant need for more education on the obesity epidemic and a need for more understanding of how to address the problem, particularly in children and adolescents. Barlow, Trowbridge, Klish, and Dietz (2002) pointed out that even the “experts” struggle with how to deal

with the situation; pediatric providers know what to do but need help with how to effectively educate and motivate parents and their children (Barlow et al., p. 234). There is also significant concern about how to identify early risk factors for obesity in childhood and adolescence and how to develop strategies for early intervention (Hampson, Andrews, Peterson, & Duncan, 2007). Creating motivation to change is a critical part of the overall need (McFarlane et al., 2009). “Most distressing is that overweight and obesity is increasing in almost every age group, and many of those who have it are unaware or indifferent to its consequences” (Hughes et al., 2005, p. 72). In an effort to increase awareness and reduce indifference, First Lady Michelle Obama has been promoting an initiative called *Let’s Move: America’s Move to Raise a Healthier Generation of Kids* (Let’s Move, 2011a), a program designed to take action on the problem of childhood obesity following President Obama’s signing of a Presidential Memorandum addressing the issue on February 9, 2010 (Miller, 2010).

Boon and Clydesdale (2005) came to the conclusion that successful treatment of childhood obesity requires clinical interventions that include the entire family. They pointed out that many individuals who are overweight and obese are not aware that there is a significant problem, but many of those who are aware demonstrate no sense of urgency or concern. Children are particularly vulnerable because if parents do not address their child’s obesity, the child is unlikely to be successful in achieving and maintaining a healthy weight (Kirschenbaum, 2010). The current literature indicates that parent involvement – including role modeling desired behaviors – is critical to children’s success (Adams, Womack, Shatzer, & Caldarella, 2009; Dardig, 2005; Harris & Goodall, 2008; Hoover-Dempsey et al., 2001; Pearson Education, 2008; Story et al., 2002).

Kirschenbaum (2010) asserted that all successful comprehensive programs advocate for

parents to become aware, educated, and motivated to address the problem; he specified that parents changing the environment in the home is one of the most critical factors to successful weight loss in children and must include eliminating high fat foods, increasing activity, and reducing screen time (TV watching, video game playing, and recreational computer usage).

Purpose. Given that the current body of research advocates for parent involvement in their children's treatment for obesity, this research project sought to gain additional understanding of the impact of parent participation. The specific site for this study was a school in a rural area of a southeastern state that can accommodate up to 50 students and maintains a staff of approximately 30 and a school in an agricultural region of a western state that can accommodate up to 80 students and maintains a staff of approximately 40 (Clinical Director, 2011). The mission of these boarding schools is to support students in reaching their healthy weight and achieving lasting behavioral change to maintain a healthy weight (Clinical Director, 2011). Because there are so few facilities of this kind, the school attracts students from all over the United States and other countries (Clinical Director, 2011).

These therapeutic boarding schools provide an intensive immersion treatment program. Immersion treatment refers to removing all the challenges of the obesogenic culture and immersing participants in conditions that are ideal for successful weight loss (Kelly & Kirschenbaum, 2010; World Health Organization [WHO], 1998). These ideal conditions include replacing TV, video games, or computer access (except for school work) with daily group social activities and sports activities to help students become physically fit, develop social skills, and understand the benefits of teamwork and face-to-face social interaction instead of sitting in front of a screen (Clinical Director, 2011).

Parent education is also a critical part of the program. The goal is to gain parental support for the behavioral change program in which their children are enrolled. A key element of the parent education is to help parents understand the importance of their role in the process, especially in regard to changing the environment in the home (Kirschenbaum, 2010). Parental support is an important indicator of success or failure for the students in the program (Kirschenbaum, 2010). The school asserts that students whose parents learn and model the program have a much higher success rate than those whose parents leave the program up to them (Hinkle, Kirschenbaum, Pecora & Germann, 2011; Kirschenbaum, Craig, & Tjelmelmeland, 2007; Kirschenbaum, Pecora, Raphaeli, & Germann, 2011). Without significant parental support, students are likely to return to old habits and regain the weight when they return home (Hinkle et al., 2011; Kirschenbaum et al., 2007; Kirschenbaum et al., 2011).

How the study was conducted. Parent participation in relationship to children's weight loss was the focus of this study. All parents who enrolled students at the schools between August 20, 2012, and September 10, 2012, were given the opportunity to voluntarily participate in a 10- to 16-week study on the relationship between parent participation and student success in a weight loss immersion program. The study was conducted in the fall semester beginning on August 20 for the students at the southeastern school and beginning on September 1 for the students at the western school; the study continued through December 8 for some of the families at the southeastern school and through November 17 for families at the western school. Recruitment of parents began in mid-July at the southeastern school but did not begin at the western school until September first because the western school did not become a part of the study until it was clear that the very low enrollment in the southeastern school would not provide an

adequate sample size for the study.

All parents were given the opportunity to participate; no material or monetary incentives were offered. Parents were asked to commit to making specific changes in the home environment and specific changes in their own behavior; these changes are explained in greater detail later in this introduction. A requirement of the study was for parents to agree to be present on campus to have their weight and height measured on three occasions: at the school when their child begins the program (August 20 through September 10), at the midpoint of the study (October 4 at the western facility or October 13 at the southeastern facility), and at the end of the study (November 17 at the western facility or December 8 at the southeastern facility – although the date at the southeastern facility later changed to November 20 which is explained in more detail in Chapter 4).

Parents were provided with self-monitoring journals when they started the study and asked to submit the completed self-monitoring journals for evaluation at the midpoint and conclusion of the study. The parents and their children completed three surveys independently at the beginning, middle, and end of the study; these surveys are explained in greater detail in Chapter 3 on methodology under the heading “Instruments and Procedures.” All parents of students attending the school – whether they participated in the study or not – were given the opportunity to have a brief orientation to the immersion program when they initially brought their child to the program and then a more in-depth mini-immersion experience midway through the semester on the weekend of October 5 through 7 at the western school or the weekend of October 12 through 14 at the southeastern school.

Contributing to the body of professional knowledge. The goal of this study was to add to the professional body of knowledge concerning ways to reduce the

epidemic of childhood obesity by investigating the relationship between a child's success in a long-term weight loss immersion program and their parents' parallel participation in the program at home. The research suggests that parents play a critical role in children achieving a healthy weight (Birch & Anzman, 2010; Bogle & Sykes, 2011; Dalton & Kitzman, 2012; Heinberg et al., 2010; Li & Hooker, 2010; Newman & Newman, 1995; Puder & Munsch, 2010). This study was designed to replicate aspects of previous studies conducted in short-term immersion treatment programs (Hinkle et al., 2011; Kirschenbaum et al., 2011) in a long-term immersion program; these previous studies have demonstrated a correlation between parent participation and children's successful weight loss (Hinkle et al., 2011; Kirschenbaum et al., 2011).

Daniel Kirschnbaum, Ph.D., coauthor of these studies, was also an integral part of this study. He is one of the committee members for this dissertation study and a mentor and friend of the author. He is currently the president and clinical director of the organization that operates the schools where this study took place. He provided permission to conduct the study and worked closely with the author throughout the study to provide guidance, ensure the quality of the study, and to complete the statistical computations for the statistical analysis used in this study.

Dr. Kirschenbaum is the author of 150 articles on weight loss and sports psychology and 10 books on weight loss including *The 9 Truths About Weight Loss* (2000) which was endorsed by the American Council on Exercise as "the best book ever written for the public on how to lose weight and keep it off" (WebMD, 2012). Dr. Kirschenbaum is a clinical psychologist, Fellow and Diplomat in Clinical Health Psychology of the American Psychological Association (APA), and former President of the APA Division of Exercise and Sports Psychology. He served as a professor of

psychiatry and behavioral sciences at Northwestern University Medical School and has been a consultant to the United States Olympic Committee, the National Basketball Association, the Ladies Professional Golf Association, the Chicago Bears, and Weight Watchers.

This researcher is cited several times as *clinical director* in sections of this dissertation that describe the weight loss immersion program that was studied because this researcher served as clinical director of the southeastern school from December 2007 to June 2011. The author also served as the interim Executive Director from March 2009 to July 2009 and during the summers worked at summer camps operated by the organization that also operates the schools: (1) Summer 2008 – clinical director for the adolescent weight loss camp in the United Kingdom; (2) Summer 2009 – clinical director of the only family weight loss camp operated by the organization that runs the schools; and (3) Summer 2010 – program director and clinical director of the family weight loss summer camp. In each of these roles, this researcher has developed significant skills in the area of supporting effective weight loss and behavioral change in parents, adolescents, and children. During the work with the organization, the author has also appeared on live national television on two occasions to promote the success of the program and was involved in multiple media projects (film, television, radio, and print outlets) to promote the program. From June 2011 through August 10, 2012, this researcher was contracted as a consultant to the school and adventure camp to provide supervision to therapists seeking licensure and for special projects. The author has been a licensed clinical social worker in North Carolina and New Hampshire since 2006 and has been a social worker providing counseling and support to children and their parents in school and community settings since 1986.

Bias. The involvement of Dr. Kirschenbaum and this researcher – with a combined commitment of over 60 years in helping individuals successfully reach their behavioral goals – created bias in that both are significantly invested in promoting the success of parents and their children. Both Dr. Kirschenbaum and the author believe that parent participation significantly impacts student success and wanted this study to provide further evidence to confirm that belief. Dr. Kirschenbaum has been involved in previous studies on immersion programs that concluded that parent participation had a significant impact on children’s success (Hinkle et al., 2011; Kirschenbaum et al., 2011), created the term weight loss *immersion* treatment (D. Kirschenbaum, personal communication, June 15, 2012), and is employed by a “leading provider of immersion treatment for children and adolescents” (Kelly & Kirschenbaum, 2010, p. 47). The primary means of controlling this bias was to exclude Dr. Kirschenbaum and this researcher from any aspect of data collection; however, due to extenuating circumstances which are discussed in greater detail in Chapter 4, this researcher became more involved in data collection than expected.

Surveys were primarily administered and data collected by therapists at the immersion treatment programs in the western facility. Therapists collected surveys as part of their usual job routine for the initial surveys, midpoint surveys, and two of four of the parents’ final surveys at that facility. The clinical director at the western immersion programs coded the data to ensure participant anonymity. Due to very low enrollment at the southeastern facility, clinical staff was laid off or worked only part-time which left no one but the clinical director available to collect data. The clinical director was the only full-time clinical staff member and was responsible for multiple roles; she was able to do most of the weight and height measurements, but distributing and collecting surveys

became the task of this researcher. The therapists and the clinical director at each school were not invested in the outcome of the study nor did they benefit in any way regarding the outcome of this study. An overview of the methodology including survey distribution and data collection is provided later in this chapter, and a detailed explanation of methodology is found in Chapter 3.

Problem Statement

The problem studied was that many parents are unaware of the epidemic of obesity or the health dangers related to it (Boon & Clydesdale, 2005; Hughes et al., 2005); and if they do become concerned about their child's weight, they are often at a loss as to what to do about it (Barlow et al., 2002). Complicating this is a parent's tendency to demonstrate a lack of motivation to change their own behavior (McFarlane et al., 2009) and, despite evidence to the contrary, a tendency to believe they have no power or ability to positively impact their children's weight loss (Hinkle et al., 2011; Kirschenbaum et al., 2007; Kirschenbaum et al., 2011). "Parent food choice, eating style, activity level, and screen time are all influences on how children will behave in relation to food intake and physical activity" (DeMattia & Denney, 2008, p. 96). Parent modeling has a significant impact on children's successful weight loss (Wrotniak, Epstein, Paluch, & Roemmich, 2005), yet parents struggle with understanding and embracing their significant role in their children's weight loss process (Hinkle et al., 2011; Kirschenbaum et al., 2007; Kirschenbaum et al., 2011).

The problem is further exacerbated by the fact that parents have the primary control over the home environment where children spend most of their time. If parents do not see the importance of their role in their child's weight loss, they can be unaware of the importance of creating a structured home environment to help facilitate their

children's weight loss (Kime, 2010; Spruijt-Metz, 2011; Thompson, 2010). Parents can positively impacts children's weight loss by structuring the household environment to include regular family meals together, consistent routines such as regular bedtimes without computers or a TV in the child's bedroom to cause them to stay up later – as sleep is a significant factor in combatting obesity (Spruijt-Metz, 2011), and putting limits on screen time (Thompson, 2010) with expectations for and facilitation of physical activity (DeBock, Fischer, Hoffman, & Renz-Polster, 2010). Parents are also primarily responsible for the food their children eat, the way in which it is prepared, and the portion sizes in which it is served which are all significant factors in achieving weight loss (Kirschenbaum et al., 2007).

The reality is that parents play a critical role in their children's achievement and maintenance of a healthy weight through their role modeling and structuring of the home environment, but they seem unsure or unaware of the importance of this role. The goal of this study was to measure two areas of parent impact: role modeling (making changes in their own habits and behavior) and structuring the home environment (making changes in the food available, level of support, and family functioning). The significant challenge for parents seeking to change their own habits and those of their children is the obesogenic culture, a culture of high fat, high calorie fast food, increased sedentary activities, and limited opportunities for physical activity. Children are particularly vulnerable due to their dependence on their parents to model and facilitate healthy behaviors (Heinberg et al., 2010; Li & Hooker, 2010; Newman & Newman, 1995; Puder & Munsch, 2010). Without a healthy environment for children to return to after enrollment in an immersion program, they are less likely to maintain their weight loss or the behavioral changes (new habits) that support maintaining weight loss. How can this

problem feasibly be addressed? Get parents to participate in making changes in themselves and changes in the home environment; this provides the opportunity for them to see for themselves what a significant impact they can have. *Telling* them that their role modeling of healthy behaviors is critical and can be helpful if they are open to listening, but *showing* them how positively they can affect their children if they choose to engage in parallel behaviors at home can have a powerful impact (Clinical Director, 2011).

In the immersion program, children typically see significant weight loss in the first week and are inspired by this initial success; within the second week they notice an increase in their energy level as they eat healthy low fat meals and exercise daily, and this energy boost tends to encourage them to continue the program (Clinical Director, 2011). Parents could benefit from similarly experiencing positive changes in themselves as they follow the guidelines of the program at home and begin seeing results. Following the guidelines would include not only increasing their activity level and eating low and nonfat foods but also changing the home environment by eliminating high fat foods and having only low fat or nonfat foods available, creating a supportive, encouraging atmosphere and facilitating healthy family functioning. These positive changes made by parents at home while their children make progress at the immersion program could potentially inspire both parent and child to continue following the program.

Evidence that a problem exists comes from evidence presented about the obesity epidemic and observing the behavior of parents related to the behavior of their children. “For example, Kirschenbaum, Germann, and Rich (2005) found that morbidly obese teenagers whose parents consistently self-monitored their own eating behaviors fared much better than their peers whose parents failed to self-monitor” (Hinkle et al., 2011, p. 3). The research indicates that one of the most important parts parents can play in

supporting their children to change behavior is to model the desired behaviors (Adams et al., 2009; Dardig, 2005; Harris & Goodall, 2008; Hoover-Dempsey et al., 2001; Pearson Education, 2008; Story et al., 2002). Parents who choose to change the home environment and their own habits tend to facilitate success in their children; those who choose not to make these changes generally watch their children regain weight after returning home as the children gradually let go of the new habits they formed in the immersion program and fall back into the sedentary, unhealthy habits they had before the immersion program (Clinical Director, 2011).

What are some possible causes related to the problem? The combination of a genetic predisposition to gain weight and an obesogenic environment has led to the obesity epidemic, according to many experts in the field (Birch & Anzman, 2010; Kirschenbaum et al., 2007; Spruijt-Metz, 2011). Genetic predisposition refers to having a body that tends to conserve energy and store fat very efficiently for times of food scarcity (Dehghan, Akhtar-Danesh, & Merchant, 2005; Spruijt-Mez, 2011). However, over approximately the last 40 years, food scarcity has not been a significant issue for most Americans. Instead, the development of an obesogenic culture has been a significant issue for two-thirds of the population in America who are not at a healthy weight (CDC, 2012). Kirschenbaum (2011) outlined some of the significant changes leading to an obesogenic culture in America. People drive more. In 1977, the average number of miles traveled per day on local trips was about 25 miles; in 2010, it was 50 miles on average (Kirschenbaum). People move less, especially children. In 1969, 90% of the children who lived within a mile of school walked or rode their bikes; in 2010, it had dropped to 50% who walked or rode their bikes (Kirschenbaum). People eat out more. In 1978, less than 4% of a person's total caloric intake came from fast food; now the

average is closer to 18%, according to U.S. Department of Agriculture Statistics (Kirschenbaum). Food portions have also changed significantly; in the early 1960s, a typical burger, fries, and a soda at McDonalds was 610 calories and 22 grams of fat; now with supersizing, the typical meal is 1,620 calories and 72 grams of fat (Kirschenbaum). Finally, the marketing budgets of big food companies selling primarily processed food averages out to \$33 billion a year, while the USDA spends less than \$1 billion annually on its 5 fruits/5 veggies a day campaign (Kirschenbaum).

Purpose and Significance

The purpose of this study was to measure the relationship between parent participation and children success in a long-term immersion program for weight loss and behavioral change. It is important to note that this program is not solely a weight loss program; it is a program to instruct and support individuals in lifelong behavioral changes to achieve and maintain a healthy weight. The hope is that the study demonstrated what the research suggests – that parents can have a significant impact on children’s success in weight loss both as role models and as the facilitators of a healthy home environment. The epidemic of childhood obesity continues to grow and the obesogenic environment continues to be a major challenge in developing effective interventions to address the childhood obesity epidemic; but parents may be in a position to have a significant impact by modeling and promoting healthy behaviors, changing the environment at home, and advocating for changes in the environment at school and in the community. If parents are made aware of the importance of their part in changing the environment and modeling healthy behaviors and each parent chooses to embrace that role, they could potentially have a significant impact on slowing the growth of the epidemic of childhood obesity.

The audience for this study was initially expected to be primarily parents along

with educators, counselors, and pediatric providers. However, as this researcher continued to review the literature, it became clear that the epidemic of obesity impacts everyone, and that parents need support to make a difference in the childhood obesity epidemic. It impacts everyone in monetary cost and the burden on the health care system; it impacts everyone in terms of health and productivity; and most significantly, it impacts everyone who cares about the future of the next generation. Children are at risk. “The situation has become so alarming that obesity is predicted to shorten the life expectancy of the average American 2 to 5 years by mid-century unless aggressive efforts are made to slow this major public health epidemic” (Rahman, Cushing, & Jackson, 2011, p. 50).

One in three adults and one in six children are overweight or obese and likely to be in danger of diabetes, heart disease, and some cancers (CDC, 2012). According to the National Vital Statistics Report *Deaths Final Data 2006*, the leading cause of death is diseases of the heart (Heron et al., 2009). If the number one cause of death is heart disease, and obesity is a significant factor in causing heart disease (Stice et al., 2005), and obesity is preventable, then everyone needs to become more aware and find ways to positively impact the problem. Everyone who has to pay the cost of obesity has a stake in addressing the issue. DeMattia and Denney (2008) concluded that based on the report *Preventing Childhood Obesity: Health in the Balance* from the Institute of Medicine Committee on Prevention of Obesity in Children (2004), it is everyone’s responsibility to combat the epidemic of obesity.

Definition of Terms

In looking at the epidemic of obesity and the parents’ role in helping their children achieve a healthy weight, several key terms and major concepts require

clarification: immersion program, obesogenic culture, obesity epidemic, and body mass index.

Immersion program. A program removing all the challenges of the obesogenic culture and immersing participants in conditions that are ideal for successful weight loss (Kirschenbaum et al., 2007; WHO, 1998).

Obesogenic culture. A culture in which it is difficult to maintain a healthy weight due to the fact that “availability of fast food, large portion sizes, energy-dense food, labor-saving devices, screen time, and automobiles and the increased frequency of eating make survival convenient and sedentary” (Janitz, Moore, Stephens, Abbott, & Eichner, 2012).

Epidemic of obesity. To clarify what is meant by the epidemic of obesity, the CDC (2011d) reported in its video *The Obesity Epidemic*,

Obesity costs this country about \$150 billion a year, or almost 10 percent of the national medical budget. Approximately one in three adults and one in six children are obese. Obesity is epidemic in the United States today and a major cause of death, attributable to heart disease, cancer, and diabetes.

According to the 2007-2008 NHANES (National Health and Nutrition Examination Survey), obesity now affects 17% of all children and adolescents in the United States – triple the rate from just one generation ago. America’s obese children are at an alarmingly heightened risk for elevated blood pressure, cholesterol, diabetes, and becoming obese adults. The financial cost of childhood obesity tips the scales at 3 billion dollars annually. (CDC, 2012)

Body mass index. The CDC determines obesity rates by using body mass index or BMI (CDC, 2011a). To calculate BMI for adults, divide weight by height squared and

then multiply by a conversion factor of 703. For example, a 5'9" (69 inches) adult who weighs 137 lbs. would have a BMI of 20.2 (CDC, 2011b). A BMI under 25 is considered healthy, while a BMI of 25 to 29 is considered overweight, and a BMI of 30 or above is considered obese (CDC, 2011a). While calculating adult BMI is fairly simple, calculating BMI for children and adolescents requires factoring growth into the equation. To simplify determining the BMI for individuals aged 2 to 19, utilizing the BMI calculator for children and adolescents provided by the CDC is recommended; however, a simpler version, used by the facility where the study took place, was used in this study.

Calculating BMI for children and adolescents requires not only weight and height but also age and gender in order to make comparisons with other children of the same age and gender. A child who is underweight would be less than the 5th percentile; a child who is at a healthy weight would be in the 5th up to the 85th percentile; a child who is overweight would be in the 85th to 95th percentile; and a child who is obese would be equal to or greater than the 95th percentile (CDC, 2011c). For example, a BMI-for-age percentile of 99% means that a child's weight is greater than 99% of other children of the same age and gender. A child in the 99th percentile would be considered obese.

Overview of Methodology

Methodological approach. This study focused on student weight loss in relationship to parent participation. This quantitative correlational study using a pretest/posttest design with an intervention measured parent participations over a 10- to 16-week period. The pretest was done when parent and child arrived at the program; the posttest was done at the conclusion of the study. In October at the midway point when the parents attended the mini-immersion parent workshop, each of the measures taken in the pretest and posttest was taken again to strengthen statistical power. The pretest and

posttest consisted of both parent and child independently completing the (1) weigh in, (2) height measurement to calculate BMI, (3) food checklist (see Appendix A), (4) social support survey (see Appendix B), and (5) family survey (see Appendix C). Parent self-monitoring was also measured at the mini-immersion parent workshop in October and in the final weekend of the study in November for the western facility and in late November through early December for the southeastern facility.

Data collection. This researcher did not initially plan to be involved in any aspect of data collection, including the distribution and collection of the three surveys, in order to reduce bias and maintain the anonymity of the participants. However, due to unexpected changes at the facilities, this plan was modified; modifications are explained in more detail in Chapter 4. Survey administration and collection were completed by therapists at the western facility for the initial, midpoint, and most of the final data collection. This researcher was more involved in direct data collection at the southeastern facility. The clinical directors at the western facility coded the surveys to ensure confidentiality prior to giving the completed surveys to this researcher; this researcher coded the surveys for the southeastern facility. Data collection of weight and height were completed by the clinical staff or clinical directors up until the final data collection when this researcher had to collect data directly from some of the parents. The only exception to initial weight and height data being collected by facility personnel was when a parent volunteered to participate at the southeastern facility after the initial orientation had already taken place. The parent could only be at the facility on a Saturday when no clinical staff was available, so this researcher arranged with her to measure her weight and height and provide her with the three surveys.

Data analysis. The analysis of the data was expected to be primarily a

correlation analysis using Pearson r s with a Bonferroni correction for total numbers of correlations examined; however, due to the very small sample size, a Spearman rho was used instead. Correlations expected to be examined were the relationships between the dependent variable of student weight loss and the five independent variables of parent weight loss, parent self-monitoring, perceptions of food available in the home, perceptions of family support, and perceptions of family functioning. Due to the very small sample size, only the initial correlation between student weight loss and parent weight loss was calculated. A Multivariate Analysis of Variance (MANOVA) had been considered in the initial study design to compare the group of parents who lost a clinically significant amount of weight with the group of parents who did not lose a clinically significant amount of weight, but the sample size was too small to create groups to make this comparison.

Setting. The setting for this study was a pair of small for-profit therapeutic boarding schools – one in a southeastern state and one in a western state – with a maximum enrollment of 50 students at the southeastern school and 80 students at the western school. The for-profit organization based in a western state that operates these two therapeutic boarding schools also operates 11 short-term weight loss immersion summer camps – 10 in the United States and one in the United Kingdom. This study was conducted at the therapeutic boarding schools that provide long-term intensive immersion treatment programs. Immersion treatment refers to removing all the challenges of the obesogenic culture and immersing participants in conditions that are ideal for successful weight loss (Kirschenbaum et al., 2007; WHO, 1998).

Sample. The sample of parents participating in the study was a “convenience” sample of parents who were “willing and available to be studied” but were not

necessarily representative of the general population (Creswell, 2012, p. 145). The sample was taken from all parents who had children enrolled at the school during the fall semester 2012 that began on August 20, 2012, at the southeastern facility and September 3 at the western facility. All parents were given the opportunity to participate. A letter explaining the study along with a release and three sample surveys (parent and child have different versions of the social support survey; see Appendices A, B, C, and D) were mailed, faxed, or presented in person to all parents beginning in mid-July and continuing through September 10 requesting their voluntary participation. No monetary or material incentives were offered. Follow-up phone calls by this researcher were made as needed to provide parents with answers to questions about the study and confirm their participation. All parents were welcome to participate, including parents who were already at a healthy weight and wanted to participate to experience the program for themselves and support their child in the program.

Concept of parent participation. The concept of parent participation is defined as (1) parent behavior or role modeling and (2) specific changes parents make in the home environment. Those specific changes in the home environment that were measured in this study were (1) eliminating high fat foods and making available only low fat or nonfat foods in the home; (2) creating a supportive, structured home environment that encourages healthy behaviors; and (3) facilitating positive family functioning including respectful, ongoing communication and family decision making.

Changing the home environment is for the benefit of both the parent and the child, but it is particularly critical to the child because the child has very limited control in the home environment; changes in the home environment are primarily the parents' responsibilities. Parents can change the environment in terms of the food that is

available, how it is prepared, and what portions are served. Parents can set the expectation for activity or exercise and provide transportation to fitness facilities, parks, or other activities. Parents can create structure and routines that promote healthy habits, personal responsibility and accountability, and provide mutual support and encouragement. These changes parents can make to the environment, combined with changes parents make to their own behavior, are considered *parent participation* for the purposes of this study.

Measuring parent participation. Parent behavioral changes (reduced fat intake and increased activity level) were measured by weighing parents, measuring their height to calculate BMI, and evaluating their self-monitoring. The three changes parents could make to the home environment were measured as follows: the food that was available in the home was measured by the food checklist completed by both parent and child independently (see Appendix A), the level of support was measured by the social support survey completed by both parent (see Appendix B) and child (see Appendix C) independently, and family functioning was measured by the family survey completed by both parent and child independently (see Appendix D).

Practical guidelines for parent participation in the program. As explained previously, parent participation in this study meant changing the home environment and changing their individual behavior, but what were the specific steps for parents to follow to accomplish these changes? Parents were not only expected to be supportive and encouraging of their child, but were expected to engage in a parallel behavioral change process at home while their child was in the program at the boarding school. In other words, parents were expected to do the program at home. “Doing the program” required following the guiding principles of the program referred to as 3-1-8 – three simple steps,

one healthy obsession, eight guidelines (Kirschenbaum, 2005). The three simple steps are (1) take at least 10,000 steps per day as recorded on a pedometer that parents and students wore from the time they got up to the time they went to bed; (2) eat very low fat; and (3) journal steps, fat and calorie intake, and thoughts, feelings, and things of importance or patterns of behavior that they began to see as they looked at what they had written in their journal (Kirschenbaum et al., 2007).

One in the 3-1-8 formula means to create a healthy obsession. A healthy obsession is defined as knowing one's biology; setting one's mind to eating very low fat; writing down all foods eaten; accepting that everything *counts*; being unwilling to permit overindulgence; planning continually, especially in problematic situations such as restaurants, vacations, parties, and family gatherings; reviewing errors to learn from mistakes and not allowing them to happen again; not being deterred if the number on the scale is not what one hoped for; feeling anxious when goals are not met and using that anxiety as a tool to do better; exercising daily even when one does not feel like it because daily exercise is the only way to succeed, and being an action-oriented problem solver who makes things happen rather than waiting for things to happen (Kirschenbaum, 2005, p. 8).

Eight in 3-1-8 refers to the eight guidelines of the program which are:

1. Make a decision;
2. Know the enemy – biology;
3. Seven elements of eating to lose:
 - a. very low fat
 - b. controlled sugar
 - c. frequent protein

- d. low density
- e. high fiber
- f. eat calories - don't drink them
- g. calorie conscious

4. Find lovable foods that love you back
 5. Move to Lose
 6. Self-Monitor and plan consistently
 7. Understand and manage stress – with and without food
 8. Make a healthy obsession last a lifetime: “Slumps and Slump Busters” (expect there will be slumps or struggles and be prepared to deal with them effectively).
- (Kirschenbaum, 2005, p. 12)

Parents were encouraged to follow this 3-1-8 formula during the study in order to maximize their success and, hopefully, the success of their children.

Limitations and Delimitations

Deficiencies in the evidence impacting study limitations. Resources on the epidemic of obesity are readily available at the CDC website under “overweight and obesity,” yet most parents and people in general are not aware of this fact (CDC, 2012). As Hughes et al. (2005) pointed out, “despite the epidemic increase of obesity people remain unaware and those who seem most indifferent are the individuals who are overweight or obese” (p. 72). Although the information about the obesity epidemic is readily available, it is not well distributed or marketed in a way that has reached the general public effectively. As mentioned earlier, the budgets for major food companies are approximately \$33 billion annually, while the USDA spends less than \$1 billion annually on its 5 fruits/5 veggies a day campaign (Kirschenbaum, 2011).

The literature stresses the importance of parent role modeling and parents creating a healthy, structured home environment (DeMattia & Denney, 2008; Wrotniak et al., 2005) but does not consistently provide clear steps for parents whose children are already obese. There appears to be more literature available on preventing obesity and creating lifestyle changes, but even these studies offer limited information on specific strategies for parents (Hendrie et al., 2012). The following example of creating lifestyle changes is from the “Let’s Move” initiative promoted by Michelle Obama (which also has a link on the CDC website). Advice to parents on this website includes:

Parents and caregivers can set a great example for the whole family by creating a healthy environment at home. Any combination of steps – making fruits and vegetables part of every meal, limiting treats, walking and playing, even shopping together – can add up to make a real difference in children’s lives and help build healthy habits for life. (Let’s Move, 2011b)

This may be helpful advice for parents to help prevent obesity or even to help slightly overweight children trim down; but for the child who is obese, this is not enough and is one of the deficiencies in the literature in general. Parents often feel helpless once their child has become obese; they look for answers in the information that is available to them, but there is not clear agreement on what intervention works best. Barlow et al. (2002) pointed out that even the “experts” struggle with how to deal with the situation; pediatric providers know what to do but need help with how to effectively educate and motivate parents and their children (p. 234).

The reality of these deficits in the literature may have negatively impacted participation in this study in that many parents were not aware of the urgency to address the issue or the importance of their participation to support their children’s weight loss.

Add to this the limited enrollment at the schools and this study had a very small sample size. However, this is a pilot study investigating the relationship between parent participation and student success in a long-term weight loss immersion program for the first time; this study also introduced the strategy of weighing parents at the facility rather than relying on self-reports and having two therapists independently evaluate parent self-monitoring journals rather than relying on parent self-reports; so even with only a very limited sample of parents, it was worthwhile to conduct the study so that other researchers can learn from the experience of this study and replicate this approach in a setting that allows for a larger sample. Another potential issue that may have reduced the sample size is the fact that families who enroll their children in the schools are from all over the United States and other countries and may not have been able to travel to the facility to be present for the weigh ins and other on-campus data collection; this may have precluded the participation for some parents who might otherwise have chosen to participate.

Organization of the Dissertation

Parents' increasing their children's potential for successfully achieving and maintaining a healthy weight is the central concept of this paper. Within this central concept are a number of important themes that became apparent during a review of the literature on the epidemic of obesity. Each of the following themes is further explored in the literature review in Chapter 2. First, it appears that despite efforts over approximately the last 40 years to slow the spread of the epidemic of obesity, it has continued to grow (Bleich, Ku, Wang, 2011; DeOnis & Lobstein, 2010; Jelalian et al., 2006; Tsiros et al., 2008; Vignolo et al., 2008). The growth continues despite the efforts of committed professionals (DeMattia & Denney, 2008; Karnik & Kanekar, 2012; Lueke, 2011). Thus,

the growth of the epidemic of obesity is the first theme explored in Chapter 2. Models of intervention, specifically prevention and treatment interventions, is the second theme based on the lack of success in halting the obesity epidemic; this theme considers the question “are there any intervention strategies that are having a significant impact?” The major challenge to successful intervention seems to be the obesogenic environment, including the built environment, the school environment, and the home environment, all of which are explored under the third theme: obesogenic environment. Parent behavior and influence is the fourth theme, and children’s behavior is the fifth and final theme.

Chapter 2 also outlines a theoretical and conceptual framework for the study and identifies and explains the rationale for the research questions and how they were measured. Chapter 3 provides the methodology in greater detail than this introductory chapter. Chapter 4 explains the results of the study and Chapter 5 discusses these results, providing recommendations for future research and implications for practice and drawing final conclusions.

Chapter 2: Literature Review

Introduction

In reviewing the literature on the epidemic of childhood obesity, several themes emerged. First, the term *epidemic* is clearly stated in the literature (Bleich et al., 2011; DeOnis & Lobstein, 2010; Jelalian et al., 2006; Tsiros et al., 2008; Vignolo et al., 2008) giving the impression that professionals in the field are well aware of the problem and working on a solution, yet the epidemic continues to grow (DeMattia & Denney, 2008; Karnik & Kanekar, 2012; Lueke, 2011) leading to the first theme in the literature review: “Growth of the childhood obesity epidemic.” One factor in the continuing growth of the childhood obesity epidemic is the professionals involved are struggling to develop a clear model to follow to stem the growth of the obesity epidemic (Barlow et al., 2002; Heitmann, Koplan, & Lissner, 2009; Rudolf, Hunt, George, Hajibagher, & Blair, 2010) which leads to the second literature review theme: “Prevention and treatment interventions.” In looking at why there is such a challenge in developing effective interventions, one piece of the puzzle became clear, most everything in the environment is working against success; thus, prompting the third theme: “Obesogenic environment.” In this section, environments impacting children’s health are reviewed beginning with new research on the “built environment” (Li & Hooker, 2010; Rahman et al., 2011; Spruijt-Metz, 2011), moving to the school environment (Karnik & Kanekar, 2012; Lawrence, Hazlett, & Hightower, 2010; Li & Hooker, 2010; Rahman et al., 2011), and concluding with the home environment over which parents appear to have the most control (Kirschenbaum et al., 2007; Spruijt-Metz, 2011; Thompson, 2010). Given that the connection between parental obesity and childhood obesity is being explored in the literature (Durand, Logan, & Carruth, 2007; Hinkle et al., 2011; Kirschenbaum et al.,

2011; Svensson et al., 2011), the next logical theme was “Parent behavior and influence”; this section provided a review of what the literature had to say about parents’ influences and potential contributions (Dalton & Kitzman, 2012; Heinberg et al., 2010; Kime, 2010; Li & Hooker, 2010; Puder & Munsch, 2010). But what about the children themselves? This question led this researcher to a fifth theme, “Children’s behavior,” but the research was very limited and this theme appears to require significantly more research given that only one article of substance was found that looked at the responsibility of children for their behavior.

In looking at each of these themes, the methodology used in the studies on prevention and treatment presented significant challenges to the reviewers. First, Berry et al. (2004) noted that in studying 13 randomized trials of family-based interventions, a significant methodological oversight was the lack of use of family systems theory as a theoretical foundation for any of the studies reviewed. Second, Stuart, Broome, Smith, & Weaver (2005) pointed out that in reviewing 17 studies of adolescent weight loss, the methodological inconsistencies made it difficult to compare studies. Attrition rates in 13 of the 17 studies ranged from 10 to 44% and the interventions were dissimilar; this diversity in methodology created significant challenges in making any meaningful comparisons (Stuart et al., 2005). Finally, immersion treatment is not mentioned in a majority of the reviews of weight loss treatment in the literature. Kelly and Kirschenbaum (2010) noted that “obese children have attended weight loss camps and residential programs for more than 40 years”; yet they found only 22 articles written in English on immersion weight loss treatment for children and adolescents that provided a minimum 10 days and 10 nights in the immersion program and reported weight change data (p. 37). Overall, in terms of methodology, much of the research on weight loss

treatment for children and adolescents is challenging to assemble into groups that can be compared because of inconsistent sample sizes, high levels of attrition, significantly different intervention techniques, and varying procedures (Berry et al., 2004; DeOnis & Lobstein, 2010; Stuart et al., 2005; Spruijt-Metz, 2011).

Themes in the Literature

Growth of the obesity epidemic. Since 1980, obesity has tripled in children 2-5 years of age, tripled in 12- to 19-year-old adolescents and quadrupled in children 6-11 years of age (Ogden, Flegal, Carroll, & Johnson, 2002). One of every three children is overweight (DeMattia & Denney, 2008). Of these, 17% are obese (DeMattia & Denney, 2008; Karnik & Kanekar, 2012) with some researchers citing even higher percentages of 19.6% of children and 18.1% of adolescents being obese in 2008 compared to only 6.5% of 6-11 year olds and 5% of 12-19 year olds in 1980 (Lueke, L, 2011). The literature is very clear: there is an obesity epidemic in both adults and children (Bleich et al., 2011; DeOnis & Lobstein, 2010; Jelalian et al., 2006; Tsiros et al., 2008; Vignolo et al., 2008) with two-thirds of the adult population of the United States being overweight or obese (CDC, 2012).

Researcher Donna Spruijt-Metz (2011) of the University of Southern California captured the frustration of the obesity epidemic in the opening comment in her comprehensive review of the last decade in obesity prevention and treatment:

More than a decade ago, the World Health Organization (1997) declared obesity to be a global epidemic and proposed a set of strategies to prevent further rises in obesity rates. In 2001, the U.S. Surgeon General published a call to action to prevent and decrease overweight and obesity (U.S. Department of Health and Human Services, 2001). However, obesity prevalence has continued to rise

exponentially in youth as well as adults. (p. 129)

The obesity epidemic in children is particularly challenging to track due to the difficulty of accounting for growth in children. It has often led to inconsistent definitions of overweight and obesity across studies, making comparisons difficult (DeOnis & Lobstein, 2010). In 2005, there was no consensus on what the cut-off points were to indicate overweight and obesity in children and adolescence (Dehghan et al., 2005), but since 2007, the WHO has formulated the cutoffs that have generally been accepted (DeOnis & Lobstein, 2010). The CDC (2011c) classified overweight as a BMI at or over the 85th percentile, while obesity is a BMI at or above the 95th percentile based on the WHO Growth Standards. BMI has some weaknesses in that it does not account for added muscularity (Dehghan et al., 2005) in athletes or body builders, but this is largely not a significant issue for 2 to 19 year olds.

The growth of the obesity epidemic in children is a combination of genetic predisposition to store fat efficiently and individual behaviors or lifestyle choices, combined with the obesogenic culture or environment that makes preventing weight gain, weight loss, or maintenance of weight loss extremely challenging (Dehghan et al., 2005; Karnik & Kanekar, 2012). Parents work longer hours, children spend more time away from home, families eat more meals out, and physical activity has been replaced with screen time; the world has changed dramatically for children over the last 40 years of the obesity epidemic (Heitmann et al., 2009).

Prevention and treatment interventions. Models of intervention include school-based, family-based, community-based (Karnik & Kanekar, 2012) outpatient therapy and immersion treatment (Kelly & Kirschenbaum, 2010). School-based prevention and treatment seems to logically make the most sense due to the amount of time children

spend in school (Lueke, 2011) and, in fact, “schools have frequently been identified as a key context for childhood obesity research” (Li & Hooker, 2010, p. 97). School-based interventions often focus on taking a curriculum-based approach to increasing activity/decreasing sedentary behaviors, positively influencing diet, reducing television viewing, increasing *active transportation* such as walking to school and bicycling to school and communities creating *safe* routes for walking and bicycling to school (Dehghan et al., 2005). Schools also offer the *triple advantage* of having students in the classroom, the cafeteria, and the gym – each individually having significant potential – conveniently located in one place that all children are required to be (DeMattia & Denney, 2008). However, these advantages appear not to have the impact one might hope for based on the limited successes of school-based interventions as reviewed in the literature (Heitmann et al., 2009; Stuart et al., 2005; Spruijt-Metz, 2011).

Since the home environment is the place where children spend most of their time outside of school, home-based interventions have received considerable attention; for example, Heinberg and colleagues (2010) asserted that “lifestyle change family based interventions are among the most successful” (p. 457). Heinberg et al. conducted a study of 104 children with at least one parent participating, requiring parents and child to agree to participate in at least 6 weeks of a 12-week program that included physical activity, reduced sedentary activity, and developing skills in behavioral change. This study is discussed in more detail under the “Parents behavior and influence” section, but basically the results were that of the 104 children, 73% attended nine or more of the 12 sessions, and 76% reduced their BMI; of these, 29, or 27.9%, lost two or more kilograms over the 12-week period. “Parent involvement (mean = 76.09) was significantly higher in those who lost weight compared with those who did not (mean = 62.65)” (Heinberg et al., p.

461). Despite the fact that family-based interventions have some record of success, they, like most interventions, tend to have less effect after the program without ongoing support (Kalavainen, Korppi, & Nuutinen, 2011).

Berry et al. (2004) reported that prior to their study “there has not been a review conducted on the family-based interventions for the treatment of childhood obesity” (p. 434). They reviewed 13 randomized clinical trials of family-based interventions conducted from 1981 to 2000 which included at least one parent and their child (ages ranging from 6 to 17) with the goal of weight reduction using nutrition, exercise, and behavioral change strategies. They looked at family-based interventions in terms of behavior modification strategies addressing changing eating and exercising habits, behavior therapy or therapeutic support from a behavior therapist, and problem solving to help families work through some of the practical challenges of changing habits (Berry et al.).

Outcomes were varied among the 13 studies, but each of these three strategies seemed to have some positive impact on outcomes. However, problem-solving techniques were most effective when used primarily with parents and were not found to be as effective when used with parent and child together or with children alone. Berry et al. (2004) also noted the challenges involved in developing interventions that address the needs of all family members across age groups, cultures, and environmental settings and stressed their concern that given these challenges, family systems theory should be considered but was not included in any of the family-based interventions they reviewed.

While Berry et al. (2004) focused on reviewing family-based interventions, Stuart et al. (2005) conducted a review of 17 studies targeting adolescent weight loss over a similar time frame – 1982 to 2003. Berry et al. reviewed studies that included children

who ranged in age from 6 to 17 years which created some overlap between the two reviews; the Berry et al. review contains three studies that have also been reviewed by Stuart et al. The interventions for adolescents reviewed by Stuart et al. included studies that compared outcomes with or without parents (mixed results); studies that were school-based stressing exercise and lifestyle change (mixed results); dietary changes (mixed results); monetary rewards (mixed results); telephone and mail-based interventions (mixed results); and medication interventions (some limited success). The attrition rates in 13 of the 17 studies ranged from 10 to 44%. Stuart et al. concluded that the studies were so diverse with inconsistent methods and a lack of testing comparable interventions or outcomes that it was difficult to make any meaningful comparisons.

More recently, Donna Spruijt-Metz (2011) of the University of Southern California conducted a review of the 10 years spanning from 1999 to 2009 of obesity influences and treatment in children and adolescents which considered genetics, environment (particularly *built environment*), and family influences as significant factors influencing obesity. Spruijt-Metz (2011) pointed out that one of the greatest challenges in the obesity battle is that people cannot avoid eating or eliminate all sedentary behaviors; they have to change behaviors in an obesogenic environment that works against them.

Spruijt-Metz (2011) summarized three reviews on *treatment* of childhood obesity and three reviews of *prevention* of childhood obesity. The summary of the treatment reviews found that in one review of over 60 interventions, only 23% demonstrated significant weight loss; the second review of 14 studies found only 14% significantly reduced weight; and the third review of 64 studies had only 12 that could be pooled to compare results, but each of these 12 had relatively positive outcomes. The most

effective of these were studies targeting family behaviors including increasing activity level, changing diet, and using behavioral interventions (Spruijt-Metz).

Spruijt-Metz's (2011) summary of three obesity prevention reviews yielded one review that had only 14 studies with BMI information, and of these only four had any significant impact on BMI which was to keep BMI from increasing; there was no reduction in BMI. The second review showed that of 61 prevention efforts studied, only 21% of these kept BMI from increasing (no reduction in BMI noted) (Spruijt-Metz). The third prevention review considered by Spruijt-Metz concluded that prevention efforts have not significantly impacted BMI in children. Spruijt-Metz concluded that future interventions will need to be *transdisciplinary* and incorporate an understanding of the complexity of the problem including physiology and neurobiology, psychosocial influences that impact obesity-related behaviors, understanding obesity related behaviors in terms of environmental influences on diet, physical activity and sleep, environmental influences and genetics, and the use of technology to connect with children in ways that are immediate and meaningful to them.

Kelly and Kirschenbaum (2010) recently conducted a review of 22 weight loss immersion programs with 10 day and night minimum stays providing nutrition education, dietary controls, physical activity, and a behavioral change component of either education or therapy or both (Kelly & Kirschenbaum). Of the 22 programs reviewed, 11 had long-term follow-up data. The authors compared immersion treatment programs and compared outcomes of the immersion treatment programs with the outcomes of educational approaches and outpatient programs. There was also some consideration of bariatric surgery as an option. Education as an intervention by itself did not yield significantly favorable outcomes; only 5% of the educational programs had any

significant impact on BMI over time. Outpatient Cognitive Behavioral Therapy (CBT) treatment programs yielded slightly better results of 8.9% over time. In considering the option of bariatric surgery, the authors noted concerns regarding side effects and the high mortality rates (2.8% at 90 days and 4.6% at 1 year) and encouraged carefully analyzing other options before considering this irreversible surgery (Kelly & Kirschenbaum).

The 22 immersion treatment programs reviewed all reported substantial weight loss, lower rates of attrition than outpatient programs, and significantly improved reduction in percent overweight at follow-up if CBT was used in the program; programs with CBT had a 30% reduction in percent overweight at follow-up versus those without CBT, which had only a 9% reduction in percent overweight at follow-up (Kelly & Kirschenbaum, 2010). One of the reasons for such dramatic results may be the advantage that immersion treatment offers in taking children and adolescents out of the obesogenic environment and placing them in an intensive therapeutic environment promoting weight loss and behavioral change for extended periods of time (Kirschenbaum et al., 2007). “Compared with results highlighted in a recent meta-analysis of out-patient treatments, these immersion programs produced an average of 191% greater reductions in follow-up percent-overweight at post-treatment and 130% greater reduction at follow-up” (Kelly & Kirschenbaum, 2010, p. 37).

While immersion treatment seems to be very effective, school-based and community-based lifestyle management strategies may have a positive impact in terms of prevention but do not typically have any significant impact on reducing weight in overweight or obese children (Hearnshaw & Matyka, 2010). Based on the conclusions of many researchers reviewed here, there seems to be a general consensus of the need for a multifaceted approach (Hendrie et al., 2012) involving families, peers, and the

community, including schools (De Henauw et al., 2011; Kalavainen et al., 2011).

Considerable emphasis has been placed on changing the environment (Berry et al., 2004; Heinberg et al., 2010; Stuart et al., 2005; Spruijt-Metz, 2011) or temporarily removing children and adolescents from the obesogenic environment to experience successful weight loss (Kelly & Kirschenbaum, 2010; Kirschenbaum et al., 2007). Several studies also take into consideration the challenge of stigma as a concern for future intervention efforts (Maher, Fraser, & Lindsay, 2010; Mansfield & Doutre, 2011; Mikhailovich & Morrison, 2007). What all interventions seem to share is the challenge of maintaining weight loss once the intervention has concluded (Kalavainen et al., 2011).

Obesogenic environment. In the previous generations children played outside more, ate out less, and did not know much about nutrition or the importance of exercise, but they did not have to because their environment was conducive to maintaining a healthy weight (Schorr Saxe, 2011). Environment plays a critical role in children's weight and behavioral choices (Birch & Ventura, 2009). Over the last 40 years, the environment has become obesogenic, meaning that multiple factors in the environment lead to significantly more energy intake with significantly lower rates of physical activity and higher rates of sedentary behavior (Bleich et al., 2011). The factors creating an obesogenic environment are generally characterized as overconsumption of inexpensive high fat low nutrient *fast* foods and increased sedentary activity – television viewing, computer usage, and spending time on the internet (Carels et al., 2010; Lueke, 2011; Thompson, 2010; Wickens-Drazilova & Williams, 2011).

“There is strong evidence to show that long-term solutions to the childhood obesity epidemic can be achieved by modifying the built environment to increase children's physical activity and access to healthful foods and reduce their access to

unhealthy foods,” according to Sallis and Glanz (2006) (as cited in Rahman et al., 2011, pp. 50-51). *Built environment* is a new area of research that emphasizes looking at neighborhood sidewalks, walking paths, bike paths, safe parks, and recreation or community centers that would promote increased activity in community members (Dehghan et al., 2005). The healthy built environment refers to what was more common 40 years ago: safe neighborhoods with sidewalks, safe parks, local markets within walking distance that have healthy food options (Sallis & Glanz), and less access to unhealthy fast food restaurants (Rahman et al., 2011). The healthy built environment can promote more physical activity and more healthful eating which could potentially promote a reduction in the obesity epidemic, although as yet there has been no definitive correlation found in the literature (Sallis & Glanz).

Another term that has emerged in relation to built environments is *urban sprawl*, defined as homes being far from the community parks and other amenities communities have to offer; distance is not the only factor, often areas for safe activity and healthy food options may not be a great distance away from homes but are not easy to walk to due to major roadways or busy intersections that would prohibit families and particularly children from walking to parks or playgrounds (Rahman et al., 2011). Noise pollution in a community is also considered by some to be part of the built environment; Spruijt-Metz (2011) included noise pollution in the community and in the home as part of the built environment, specifying that in the home, noise pollution can be caused by computers, TVs, and particularly by computer or internet access in a child’s bedroom. These environmental factors can negatively impact sleep – one of the “pillars of metabolic health” – which has recently been a focus in some of the childhood obesity literature (Spruijt-Metz, 2011, p. 137).

In addition to the built environment in the community, children are influenced by multiple other environments (DeMattia & Denney, 2008; Lawrence et al., 2010; Spruijt-Metz, 2011). Davidson and Birch (2001) asserted that there is the genetic environment, the family environment, and the larger community (as cited in DeMattia & Denney, 2008, p. 86). Genetics play a major role in obesity in that some children are born with the genetic predisposition to store fat efficiently on their bodies which would be very beneficial in an environment of food scarcity but becomes extremely detrimental in an environment of over abundant, energy rich foods in large portions combined with increased sedentary behaviors and reduced physical activity (Birch & Anzman, 2010; Kirschenbaum et al., 2007; Spruijt-Metz, 2011). When the genetically predisposed child meets the obesogenic environment in the community, at school, and in their own home, the likelihood of a child becoming obese is substantial if significant interventions are not put in place (Dehghan et al., 2005; Spruijt-Metz, 2011).

The school environment is a part of the community environment in which children spend on average 6 hours a day – typically more than in any other environment except home (Lawrence et al., 2010; Li & Hooker, 2010; Rahman et al., 2011; Karnik & Kanekar, 2012). Rather than being a haven from the larger culture, schools can often be a reflection of the larger culture as evidenced by the easy availability of sugary and high fat foods (Lawrence et al., 2010; Spruijt-Metz, 2011). The obesogenic culture can also negatively impact schools when fast food is easily accessible near the school; “one study found that among ninth graders, the presence of a fast food restaurant within a tenth of a mile – about 530 feet – of a school is associated with a $\geq 5.2\%$ increase in obesity rates” (Rahman et al., 2011, p. 51). However, schools have the potential to be one of a number of environments that could positively impact children.

In looking at the impact of environment on childhood obesity in the literature, there seems to be agreement that a successful approach will require addressing multiple environments (Birch & Ventura, 2009; Carels et al., 2010; Hendrie et al., 2012; Schorr Saxe, 2011). Hendrie et al. (2012) reviewed 15 studies on obesity prevention interventions involving at least one parent and school age child and concluded that targeting multiple settings – home, school, community – has the most potential for impacting obesity prevention. The successful prevention efforts promoted the following two behavioral changes across settings (in the home, school, and community): providing parents, children, and other stakeholders with knowledge about the connection between behavior and health and prompting practice of behavioral changes that support achieving and maintaining a healthy weight; in addition, the following two behaviors were also very effective but were primarily used in the home environment: modeling desired behaviors and prompting self-monitoring of behavior (Hendrie et al.). Hendrie et al. noted that self-monitoring in particular is a very effective component of obesity prevention, and “self-monitoring can be relatively easily incorporated into a family routine, school curriculum, or community programs through activities such as food and physical activities diaries and checklists” (p. 169). These same prevention efforts across settings have the potential to impact obesity treatment in that children returning from an obesity treatment program benefit from the changes in environment noted above in their effort to maintain the weight loss achieved in the treatment program. Kirschenbaum (2010) noted that self-monitoring in particular is one of the key predictors of successful weight maintenance following an immersion treatment program.

Other environmental considerations include changes in the home itself. Children observe the environment around them – especially the home environment where they

spend most of their time – to learn how to behave (Newman & Newman, 1995; Puder & Munsch, 2010). Parents are the role models children imitate (Newman & Newman, 1995; Thompson, 2010). Parents have the power to change the home environment to restrict children from having TVs, computers, video games, and other internet devices in their room to reduce the likelihood that a child will suffer from a lack of sleep (Spruijt-Metz, 2011). Hours watching TV or playing video games has been shown to potentially increase a child's BMI (Li & Hooker, 2010). Restricting television viewing, restricting eating in front of the television, and restricting advertising to children via TV are all strategies worth considering (Dehghan et al., 2005). Parents who model regular exercise and activity in the home environment have a significantly positive impact on BMI (Li & Hooker, 2010).

The family meal together is another aspect of the home environment that seems to have a positive impact on BMI (Maher et al., 2010). Kime (2010) looked at the changes in eating patterns over the last three generations and found that the family meal was a consistent expectation in the grandparents' generation, but over the last 40 years that structure has deteriorated. Parents noted that expectations for daily family meals together gradually changed due to greater choice about what to eat and increased freedom regarding where to eat. Children saw their own independence coupled with their parents' work schedules as leading to the expectation of family members consistently eating separately (Kime). Families eating out more means that they are accessing the higher fat, larger portions promoted at restaurants rather than cooking at home where they could potentially select lower fat ingredients using lower fat cooking methods (Kirschenbaum et al., 2007).

Parent's behavior and influence. Studies on the obesity issue have often

focused on individual behavior and individual responsibility related to diet and exercise (Dehghan et al., 2005). Studies relating to the epidemic of childhood obesity have often focused more on parent behavior based on the parents influence on their children in the home environment, but the concept of having children take responsibility for their behavior is being explored (Lueke, 2011). Many more recent studies are taking a holistic approach of looking at the behaviors of parents and children in the context of the larger environment (Dehghan et al., 2005; Hendrie et al., 2012; Li & Hooker, 2010). This new trend does not eliminate the focus on parent behaviors; however, the fact is that parents have a very significant impact on their children's behavior through modeling (Heinberg et al., 2010; Li & Hooker, 2010; Newman & Newman, 1995; Puder & Munsch, 2010), reinforcing behavior (Dalton & Kitzman, 2012), and creating structure in the home environment (Kime, 2010; Thompson, 2010). Some studies indicate that teaching the parent and child together is most effective (Dalton & Kitzman, 2012), while others conclude that there is little difference in teaching the parent independently or parent and child together (Bogle & Sykes, 2011). Whichever course of action is taken, educating parents to influence their children's behaviors is an effective means to increase healthy behaviors in overweight and obese children (Birch & Anzman, 2010; Bogle & Sykes, 2011; Dalton & Kitzman, 2012).

Given that the focus of this study was parent involvement in treatment, this literature review takes a closer look at two recent studies focusing on parent participation in treatment (Heinberg et al., 2010; Kirschenbaum et al., 2011) and one recent study that focuses on the impact of family functioning on obesity risk behaviors (Wen, Simpson, Baur, Rissel, & Flood, 2011). The first study conducted by Heinberg et al. (2010) followed 104 children (64% girls and 36% boys, average age 11 years) and their mothers

(only 8% of the parent participants were fathers) through a weekly 2-hour multi-family 12-week class on increasing physical activity, reducing sedentary behaviors, improving nutrition, and developing behavior change skills (Heinberg et al., 2010). The study evaluated 182 potential participants but screened out those who actively or passively demonstrated resistance. Each week families set a dietary goal, an activity goal, and a goal for changing a behavior, and parents were rated by their assigned caseworker on follow-through with goals, participation in class, and self-monitoring outside class. Results indicated that 70% of the children experienced some decrease in BMI, but only 27.9 % lost ≥ 2 kg weight; 30% maintained or increased their BMI. Although the weight loss was limited, the significant finding was that the parents who demonstrated more active involvement by attending the majority of the sessions, participating actively in the classes, and following through on self-monitoring and the goals set each week had a significantly positive impact on those children who lost weight in comparison to those who did not. The parent involvement mean rating was 76.09 for parents of children who lost weight versus 62.65 for parents whose children did not lose weight (Heinberg et al., 2010).

Kirschenbaum et al. (2011) studied the impact of parent participation in a 3-day mini-immersion parent training that taught parents all aspects of the immersion program in which their children were enrolled. Parents engaged in a parallel behavioral change model in which they did the program their children were doing and learned how to replicate the program at home to support their children's success. Significant aspects of the parent role in supporting their children were to eliminate high fat food from the home, model change in themselves, create structure, and provide encouragement in the home. The study contacted parents for follow-up on average 1.5 years after their children had

left the program; children on average had been in the program 6 weeks and parents had their mini-immersion program training of 3 days. Results of the study demonstrated that even after a year and a half had elapsed – with parents only having had a 3-day immersion training – there was substantial weight loss in 22 of the 49 mothers who were overweight at the beginning of their child's immersion treatment program.

Mothers of children who gained weight after treatment did not differ significantly from those mothers whose children continued to lose weight following completion of the immersion program. Both groups of mothers lost weight following the low calorie, low fat consumption and increased activity level principles of the immersion program, but some children responded positively to this modeling by imitating the behavior and others did not. This led the researchers to conclude that other issues besides parental modeling and support must have negatively impacted the teens who gained weight following the program. Overall, however, the study concluded that parent participation, that is parents actually doing the program in a parallel process with their child who is doing the program, had a significantly positive impact on their children's weight loss and behavioral change (Kirschenbaum et al., 2011).

Wen et al. (2011) asserted that finding ways to improve and enrich family functioning for the benefit of all family members' health and well-being has become recognized as an important public health concern, especially in relation to efforts to intervene in the epidemic of obesity. Low family functioning scores have been connected to higher BMI in children, and some studies indicate that family functioning may provide information for developing effective interventions in reducing childhood obesity (Wen et al.). According to Dinsmore and Stormshak (2003), poor family functioning makes families vulnerable to engaging in unhealthy eating patterns, poor attitudes, and high risk

behaviors (as cited in Wen et al., p. 1256). Mothers also tend to be at risk of repeating dysfunctional behaviors – including high risk behaviors for obesity – when they have not had healthy models to emulate in their family of origin (Wen et al.). Wen et al. studied family functioning in relation to “maternal obesity risk behaviors” because there were so few studies available that directly correlate family functioning with obesity risk (p. 1256). Given the impact of parent participation on children’s weight loss (Heinberg et al., 2010; Kirschenbaum et al., 2011) and the impact of the home environment on children’s behavior (Puder & Munsch, 2010; Spruijt-Metz, 2011; Thompson, 2010), it seems reasonable to consider that family functioning would have an impact on childhood obesity. Wen et al. concluded that family interventions should focus on family structure and developing a supportive family environment.

As this discussion of the literature relating to parents concludes, it is important to be sensitive to some of the significant challenges faced by the parents of children who are overweight or obese. Parental obesity is a significant indicator of obesity in children, and children with two obese parents are at a very high risk of severe obesity in adolescence (Svensson et al., 2011). Mikhailovich and Morrison (2007) studied the reaction of parents when they are told their child has a weight problem. They stressed the challenges for parents who are learning of their child’s weight problem and attempt to prepare professionals for the multiple emotions parents can feel, ranging from relief to anger, with denial and disinterest also being common responses (Mikhailovich & Morrison). Their recommendations were to provide parents with clear information and support for parents’ emotional needs – especially related to parent concerns about their child being stigmatized – and avoid putting all the responsibility on the parent, but instead also emphasize the environmental factors that impact the obesity problem (Mikhailovich &

Morrison). Wickens-Drazilova and Williams (2011) agreed that interventions must be cautious not to blame parents but rather to empower them; they asserted that, in fact, the whole society has a responsibility to prevent childhood obesity.

Children's behavior. Just as it is important to be sensitive to the difficulties faced by parents, it is even more important to be sensitive to the difficulties involved in being an overweight or obese child – depression, low self-esteem, social isolation, and limited opportunities (Lawrence et al., 2010; Puder & Munsch, 2010). This is not a section on *blaming the victim*, as explained in William Ryan's (1976) classic book of the same title, in the same manner that the last section was not about blaming the parent. This is a question of each person taking responsibility for what they can do to reduce childhood obesity; everyone has a responsibility to combat the epidemic of childhood obesity (DeMattia & Denney, 2008; Wickens-Drazilova & Williams, 2010). Lueke (2011) pointed out,

Because obesity rates continue to climb, it is apparent that states have been unsuccessful at implementing effective strategies to combat the epidemic. In addition to state government, fingers have been pointed at parents, schools, and fast food chains, but scholars and legislators seem to forget about placing some responsibility on children. (p. 206)

But what can children do if they don't have information on which to base healthy choices? Perhaps they are a victim of their environment. This is the point Lueke (2011) made in the only article of substance considering children's behaviors and personal responsibilities. Without the support of education programs that teach children how to achieve and maintain a healthy weight, children do not have the opportunity to make informed choices (Lueke). If children do not have the opportunity to make informed

choices, that is, if they do not know any better, then how can they be expected to take responsibility for their behavior (Lueke)?

Social Learning Theory states that children learn from their environment, from watching what those around them do, and from imitating the behavior that is modeled (Newman & Newman, 1995). If the environment is not conducive to children learning how to make healthy food choices, practice regular physical activity, and understand the consequences of poor eating habits and sedentary behavior, then the environment needs to change (Lueke, 2011). Lueke (2011) concluded that the federal government must create an incentive program that mandates states to enact and enforce policies that require schools and communities to provide children with the opportunity to learn about how to achieve and maintain a healthy weight so that they can exercise their responsibility in efforts to reduce the childhood obesity epidemic.

Conceptual Framework

This study is grounded in Social Learning Theory which has a primary focus on the impact of modeling in a social environment (Newman & Newman, 1995). In this study, the impact of parent modeling or participation in an immersion program along with parent's modifications of the physical and social environment at home was monitored. Children success was measured in relationship to parents' participation. Did parent participation positively impact their child's success in the immersion program? In addition to being grounded in social leaning theory, this study used the conceptual framework of two change models that provided a framework for dealing with the considerable challenges involved in making the lasting changes required to achieve and maintain a healthy weight.

For example, why is it that 99% of Americans know that "exercise is vital to

preserving health (International Health, Racquet and Sportsclub Association, 2007) but less than half of all Americans get the recommended amount of physical activity each day?” (DeMattia & Denney, 2008, p. 85). What is it that translates knowledge or awareness into action? The research is clear that there is an epidemic of obesity, but despite the efforts that have been mounting over the last 4 decades as this literature review attests, the obesity epidemic continues to rise. Why?

There are a multitude of potential answers to the why question, but one area worth considering that has not gotten a great deal of attention in the obesity literature is how to support individuals through the challenge of changing behavior, and what theories of change might be helpful in providing such support. First, nearly 2 decades ago and several years prior to the WHO (1998) declaring obesity to be a global epidemic, Prochaska, Norcross, and DiClemente (1994) created a six stage model of change: (1) Pre-contemplation – Resisting Change; (2) Contemplation – Change on the Horizon; (3) Preparation – Getting Ready; (4) Action – Time to Move; (5) Maintenance – Staying There; (6) Recycling – Learning from Relapse. Kirschenbaum et al. (1992) noted Prochaska et al.’s stages of change and focused on stage four, “Action,” to create stages of change specific to weight control; Kirschenbaum et al.’s (1992) model was created in the early 1990s, published in 1992, and refined over time to become part of the conceptual framework for change used at the schools where this study was conducted.

Prochaska’s stages of change explained. Prochaska et al.’s (1994) model has become the standard for conceptualizing change and supporting individuals through the change process in a variety of applications; it is familiar to most therapists and is used by The National Cancer Institute and the CDC (2007) to support behavioral change. What makes Prochaska et al.’s theory of change unique is that the theory acknowledges that

people are not necessarily ready for the action step in the change process, yet most programs are primarily focused on the action phase of the change process. By acknowledging and embracing all the stages in addition to the action stage, people engaging in the change process and those around them can make sense of what's happening or not happening when embarking on the change process (Prochaska et al.).

During the precontemplation stage, an individual is usually the last to be aware that change is required; "family, friends, neighbors, doctors, or co-workers" can see the problem clearly, but the individual does not acknowledge or want to hear about the problem (Prochaska et al., 1994, p. 40). An important consideration is that people in the precontemplation stage are not only typically in denial, but they are also often feeling demoralized and hopeless. When individuals enter the contemplation phase, they are feeling the pressure to get *unstuck* and want to gain some understanding of the problem; they may even develop some sense of a goal or possible solutions, but they are not ready to take action yet. Prochaska et al. (1994) noted that "Many people remain stuck in the contemplation stage for a very long time. Self-change smokers whom we studied typically spent two years in contemplation before taking action" (p. 42).

Preparation is the third stage in the model and is characterized by a public declaration of the intention to change along with planning for the change. Individuals typically begin to make small behavior modifications and work out a strategy for how they will take action to make the major changes they have been contemplating. The next stage is the one most programs are built around: action. This is when people demonstrate modifications in their behavior and/or their environment. The important consideration in this stage is that ongoing encouragement is required; action that appears to be evidence of change is not necessarily a lasting change in behavior. This is the time individuals need

continued support to maintain the action they are attempting. Unfortunately, others around the individual can interpret the action as change and overlook the need for ongoing encouragement.

Maintenance is the fifth stage that Prochaska et al. (1994) described as “a critically important continuation that can last from as little as six months to as long as a lifetime” (p. 45). This stage is of particular importance to individuals seeking to achieve a healthy weight and definitely lasts a lifetime if weight loss is to be maintained (Kirschenbaum et al., 2007). Finally, termination is the sixth stage identified by Prochaska et al. and is characterized by the absence of the need for maintenance. Prochaska et al. acknowledged that there has been some debate regarding termination, stating that some experts argue that certain problems cannot be terminated, but Prochaska et al. asserted that some, such as quitting smoking for some individuals, can reach a point where there are no further cravings and no fear of relapse. Others can remain in the maintenance phase because they never lose their craving for cigarettes or their fear of relapse (Prochaska et al., p. 46).

Stages of change in successful weight loss. Kirschenbaum et al. (1992, 2007) outlined six stages of change: three “primary” and three “secondary”. “Honeymoon,” “Frustration,” and “Acceptance” are the three primary stages; and “Shock/Ambivalence,” “Fear of Success,” and “Lifestyle Changes” are the three secondary stages as illustrated in the figure below (Kirschenbaum et al., 2007, p. 57).

Stages of Change in Successful Weight Control

PRIMARY STAGES

HONEYMOON >>>>> FRUSTRATION >>> <<< ACCEPTANCE

Secondary Stages

Shock/Ambivalence Fear of Success Lifestyle Change

Figure 1. *Kirschenbaum's Stages of Change in Successful Weight Control.*

Kirschenbaum et al. (1992, 2007) asserted that most children and adolescents experience only the primary stages, but some – a very limited number – experience the secondary stages. Therefore, this review of the stages of change in successful weight loss will begin with the primary stages that affect most weight controllers and conclude with the secondary stages. In looking at the primary stages, it is important to note that individuals move back and forth between frustration and acceptance as illustrated by the arrows pointing back and forth between frustration and acceptance in the previous figure (Figure 1). Frustration is an inevitable part of the weight loss process, and individuals may shift in and out of this stage over time as they pursue their weight loss goals.

The first primary phase, the “Honeymoon” phase, is that initially exciting time of anticipation, optimism, and positive feelings. Individuals tend to experience success, expect good things to happen, and do not anticipate any problems. However, the honeymoon does not last and is followed by the second primary stage of “Frustration,” characterized by children and teens feeling that it is unfair that they have to work so hard when everyone else does not have to work at weight loss at all. It is a period of irrational thinking and discouragement that can last for long periods. Overcoming the frustration phase can be expedited by using supportive strategies to shift a child’s or teen’s attitude

toward acceptance, change their expectations to keep up with their weight loss behaviors regardless of what the scale says, “get back to basics,” “emphasize activity,” and persevere toward the goal knowing that every day of effort brings the goal of reaching a healthy weight closer (Kirschenbaum et al., 2007, p. 61).

The third primary stage is “Acceptance” and is characterized by settling into an accepting attitude toward the work involved in weight loss and an acceptance of the importance of persevering. This does not mean there will not be challenges or occasional lapses, but for the most part the child or teen has committed to maintaining a positive attitude and developing the habits to lose weight and maintain their weight loss.

A minority of children and teens experience the secondary stages, the first of which is “Shock and Ambivalence”; they struggle with the work involved in the weight loss process and tend to look for a quick fix. Their behavior is characterized by trying a variety of strategies briefly without giving anything a sustained effort. The emotions they experience are usually surprise or disbelief and sometimes anger at not being able to have what they want how they want it (Kirschenbaum et al., 2007). The second secondary phase is “Fear of Success” which involves irrational underlying assumptions that support the child’s or adolescent’s irrational fears. An example of an underlying irrational assumption would be “I am destined to fail.” This produces the fear, “I will gain back the weight I’ve lost.” A supportive parent or family member could help the child or teen by using the counter-rationalization,

Managing weight is a difficult task. Making mistakes is a part of the process. I am still learning to manage my weight. I can expect lapses from time to time. I can learn more about myself and successful weight management by learning from my lapses. (Kirschenbaum et al., 2007, p. 63)

The third secondary stage is “Lifestyle Change,” and this stage is “the ultimate goal” when children’s commitment to maintaining positive habits has developed into a high level of confidence in themselves and their ability to manage their weight effectively (Kirschenbaum et al., 2007, p. 67). Typically, most children and teens take years to get to this stage because of the maturity and sound judgment required (Kirschenbaum et al., 2007).

Need for further research. Based on the limited research described in the previous section, it may be helpful to gain more information about the thoughts, beliefs, and feelings of children regarding their roles and responsibilities in addressing the childhood obesity epidemic. Preadolescents and adolescents in particular could possibly offer some insights given their developing level of personal autonomy and desire for independence (Newman & Newman, 1995). Adolescents are particularly vulnerable in that statistics indicate that 80% of adolescents who are obese will become obese adults (DeMattia & Denney, 2008), up from 70% as reported in statistics from the 1990s (Dehghan et al., 2005).

Does the average person have an awareness of the obesity epidemic? “One would have to be Rip Van Winkle not to know that childhood obesity threatens the future of the next generation” (Schorr Saxe, 2011, p. 546). This is the opinion of one physician; the literature is unclear about how much the average person who is not a professional dealing with the obesity epidemic knows about its existence. “The current level of investment does not match the scale of the problem,” concludes the report from the Institute of Medicine in their publication *Progress in Preventing Childhood Obesity: Do We Measure Up?* (DeMattia & Denney, 2008, p. 85). If the public is aware of the obesity epidemic, it would seem that there might be more public outcry for investment in fighting

the epidemic. This epidemic of child and adolescent, as well as adult obesity is a preventable situation and yet efforts to curb the epidemic are not nearly aggressive enough (Durand et al., 2007) given the likelihood that today's obese children will live shorter lives than their parents (Spruijt-Metz, 2011). There seems to be a lack of awareness or a missing sense of urgency in the general public, and it may be beneficial to study the level of awareness in the general public; it would be helpful to determine if more awareness would impact having a sense of urgency and/or investment in dealing with the epidemic of obesity.

One of the significant weaknesses in the research on the childhood obesity epidemic is that much of the research is difficult to pool to make comparisons due to the varying procedures, inconsistent sample sizes, and vastly different intervention techniques (Berry et al., 2004; DeOnis & Lobstein, 2010; Stuart et al., 2005; Spruijt-Metz, 2011). The Institute of Medicine, in its report *Progress in Preventing Childhood Obesity: How Do We Measure Up?*, noted that evidence-based approaches are needed and that the evidence of what works is lacking (DeMattia & Denney, 2008, p. 85). The research on childhood obesity does not offer clear direction or consensus on what to do; Heitmann et al. (2009) summarized the dilemma succinctly: "in reality relatively little is known about how to intervene effectively" (p. 590).

Research Questions

After reviewing the research, the evidence seems to indicate that parental role modeling of healthy behaviors and facilitation of a healthy home environment are significantly important in impacting the epidemic of obesity (Birch & Anzman, 2010; Bogle & Sykes, 2011; Dalton & Kitzman, 2012; Dehghan et al., 2005; Heinberg et al., 2010; Hendrie et al., 2012; Hinkle et al., 2011; Li & Hooker, 2010; Newman & Newman,

1995; Puder & Munsch, 2010; Spruijt-Metz, 2011; Thompson, 2010). This study was designed to measure the impact of changes in parent modeling of healthy behaviors and changes parents make to the home environment. The following research questions address these two areas of change. Questions 1 and 2 address individual changes parents make in their behaviors that would be considered role modeling of desired behaviors. Questions 3, 4, and 5 focus on changes parents may make in the home environment.

1. What is the relationship between parent weight loss and weight loss of a child enrolled in a long-term weight loss immersion program?
2. What is the relationship between parent self-monitoring and weight loss of a child enrolled in a long-term weight loss immersion program?
3. What is the relationship between self-reports of food available in the home and weight loss of a child enrolled in a long-term weight loss immersion program?
4. What is the relationship between perceptions of family support and weight loss of a child enrolled in a long-term weight loss immersion program?
5. What is the relationship of perceived family functioning and weight loss of a child enrolled in a long-term weight loss immersion program?

Looking at each of these questions individually, what methods does the literature suggest for examining these questions? Question 1 asks, “What is the relationship between parent weight loss and weight loss of a child enrolled in a long-term weight loss immersion program?” This is the most significant variable or central measurement of the study, and unlike other studies that rely on parent self-reports of weight loss, this study actually weighed parents at the school where their children were attending a weight loss immersion program. Parents were weighed when they dropped off their children between August 20 and September 10, and when they attended the parent workshop weekend

midway through the study either on October 6 or October 13 and again when they attended the closure weekend for the study either on November 17 or November 20, 2012. The relationship between parental obesity and childhood obesity is being explored in the literature (Durand et al., 2007; Svensson et al., 2011); other studies have utilized parent self-reports of weight loss to look for correlations between parent weight loss and children's weight loss (Hinkle et al., 2011; Kirschenbaum et al., 2011).

Question 2 inquires, "What is the relationship between parent self-monitoring and weight loss of a child enrolled in a long-term weight loss immersion program?" The literature provides significant information on the positive impact of parent role modeling, but information on quantitatively measuring parent behavioral change is not as abundant. However, the concept of self-monitoring has been linked to behavioral changes in successful weight control strategies (Hendrie et al., 2011; Kirschenbaum, Germann, & Rich, 2005; Kirschenbaum et al., 2011) and could offer a tangible way to demonstrate parent behavioral change. Parents received the same self-monitoring journals their children received at the start of the program and were instructed on how to self-monitor the behavioral changes they made; they were asked to show their child's behavioral coach (therapist) their self-monitoring journal when they were on campus in October and November to allow two therapists to independently evaluate the parents' self-monitoring.

Question 3 moves from the area of parents' role modeling desired behavioral change to parents impacting the home environment: "What is the relationship between self-reports of food available in the home and weight loss of a child enrolled in a long-term weight loss immersion program?" To examine this question, the research suggests the use of a household food inventory as discussed in the literature as a measure of the dietary habits of members of a household (Patterson, Kristal, Shannon, Hunt, & White,

1997). This type of measurement tool has been validated in more current literature (Fulkerson et al., 2008) and has been used successfully in studies similar to the one undertaken here (Hinkle et al., 2011). The food checklist that was used in this study is identical to the one used by Hinkle et al. (2011) and is located in Appendix A of this document.

Question 4 inquires, “What is the relationship between perceptions of family support and weight loss of a child enrolled in a long-term weight loss immersion program?” The literature refers to the *Social Supports Survey for Diet and Exercise Behavior* as a valid and reliable instrument for determining positive changes in health habits (Sallis et al., 1987). The version contained in Appendix B is the parent version of the survey and the version contained in Appendix C is the student version of the survey, each of which were used successfully by Sampat (2011) in her study on the impact of social supports and self-confidence on successful weight loss.

Finally, Question 5 asks, “What is the relationship of perceived family functioning and weight loss of a child enrolled in a long-term weight loss immersion program?” The tool that was used to respond to this question is called the General Functioning (GF) subscale; it is derived from the McMaster Family Assessment Device (FAD), a 53-item family assessment that is well documented in the literature as a valid and reliable assessment of family functioning (Byles, Byrne, Boyle, & Offord, 1988; Epstein, Baldwin, & Bishop, 1983). The GF offers a shorter, 12-item assessment that is easier to administer and score but maintains a high correlation to the FAD (Byles et al., 1988). This survey can be found in Appendix D and has recently been used successfully by Hinkle et al. (2011) in their study of parent impact on student success and by Sampat (2011) in her study on the impact of social supports and self-confidence on successful

weight loss.

Summary

This study is grounded in Social Learning Theory which has a primary focus on the impact of modeling in a social environment (Newman & Newman, 1995) and uses a conceptual framework of two different change models: Prochaska et al.'s (1994) six stage model of change (1. Pre-contemplation – Resisting Change; 2. Contemplation – Change on the Horizon; 3. Preparation Getting Ready; 4. Action – Time to Move; 5. Maintenance – Staying There; 6. Recycling – Learning from Relapse) and Kirschnbaum's delineation of the Prochaska et al.'s action stage into 6 stages of change specific to weight controllers: primary stages of "Honeymoon," "Frustration," and "Acceptance" with secondary stages of "Shock/Ambivalence," "Fear of Success," and "Lifestyle Changes" (Kirschenbaum et al., 1992, 2007).

As evidenced in the literature review, the research offers abundant information about studies on treatment and prevention, the obesogenic environment, and parent responsibility but does not offer a clear understanding of what to do about the obesity epidemic (Barlow et al., 2002; DeMattia & Denney, 2008; Heitmann et al., 2009). The built environment has emerged as a newer area of focus that identifies the need for building activity conducive environments that include bike paths, sidewalks, walking trails, safe parks, and local markets within walking distance that have healthy food options (Dehghan et al., 2005; Rahman et al., 2011; Sallis & Glanz, 2006).

Some of the most effective interventions noted in the literature seem to target family behaviors including increasing activity level, changing diet, and using behavioral interventions (Spruijt-Metz, 2011). Immersion treatment appears to be a promising intervention that takes children out of the obesogenic environment and places them in a

therapeutic environment designed to develop healthy behaviors that promote and maintain significant weight loss (Hinkle et al., 2011; Kelly & Kirschenbaum, 2010; Kirschenbaum et al., 2011). However, efforts to slow the rise of the epidemic have been largely unsuccessful as evidenced by the continued growth of the childhood epidemic of obesity, specifically that since 1980, obesity has tripled in children 2-5 years of age, tripled in 12- to 19-year-old adolescents and quadrupled in children 6-11 years of age (Ogden et al., 2002).

This study was designed to provide information to contribute to the body of knowledge that will lead to a reduction in the spread of the childhood obesity epidemic. The goal was to provide information on the relationship between parent participation and children's success in a long-term weight loss immersion program. Chapter 3 provides the methodology that was used in this study. Chapter 4 explains the results of the study, and Chapter 5 discusses those results in terms of implications for practice, recommendations for future research, and conclusions.

Chapter 3: Methodology

Introduction

This study addresses the relationship between parent participation and student success in a long-term weight loss immersion treatment program and seeks to answer the following research questions: (1) What is the relationship between parent weight loss and weight loss of a child enrolled in a long-term weight loss immersion program? (2) What is the relationship between parent self-monitoring and weight loss of a child enrolled in a long-term weight loss immersion program? (3) What is the relationship between self-reports of food available in the home and weight loss of a child enrolled in a long-term weight loss immersion program? (4) What is the relationship between perceptions of family support and weight loss of a child enrolled in a long-term weight loss immersion program? (5) What is the relationship of perceived family functioning and weight loss of a child enrolled in a long-term weight loss immersion program?

Immersion treatment refers to removing a child from the obesogenic environment for a minimum of 10 days and 10 nights and immersing them in a therapeutic learning environment that fosters behavioral change to achieve a healthy weight (Kirschenbaum et al., 2011). The weight loss immersion treatment program that was studied is a long-term weight loss immersion program where students ages 11 to 18 are typically enrolled for a full semester or a full school year; first semester starts at the end of August/beginning of September and continues through mid-January; second semester begins mid-January and concludes in late May/early June. Most students go home for winter break from approximately December 21, 2012 to January 2, 2013. This study ended on November 17 at the western facility and November 20 at the southeastern facility, although some parents requested to continue through the original end date of December 8, 2012. The

study was designed to end before the mid-winter break of the semester to avoid the potential loss of participants and scheduling challenges presented by the long winter holiday break.

The long-term weight loss immersion program where this study was conducted is a pair of small for-profit therapeutic boarding schools providing long-term weight loss immersion programs, operated by a for-profit organization based in a western state that also operates 11 short-term weight loss immersion summer camps –10 in the United States and one in the United Kingdom. The schools where this study took place are in a rural area of a southeastern state and in an agricultural area of a western state; the southeastern school could accommodate up to 50 students and maintains a staff of approximately 30, and the western school can accommodate 80 students and maintains a staff of approximately 40 (Clinical Director, 2011). The mission of the boarding schools is to support students in reaching their healthy weight and achieving lasting behavioral change by immersing students in ideal conditions for losing weight that include no TV, video games, or computer access (except for school work) and daily group social activities and team sports with a personal trainer to help students become physically fit, develop social skills, and understand the benefits of teamwork instead of sitting in front of a screen (Clinical Director, 201). Each student is assigned their own individual therapist or behavioral coach whom they meet with one-on-one weekly; students attend cognitive behavioral therapy groups twice a week.

Parent education is also a critical part of the school program. The goal is to gain parental support for the behavioral change program in which their children are enrolled. A key element of the parent education is to help parents understand the importance of their role in the process, especially in regard to changing the environment in the home

(Kirschenbaum et al., 2007). Students whose parents learn and model the program generally have a much higher success rate than those whose parents leave the program up to them; without significant parental support, students are likely to return to old habits and regain the weight when they return home (Kirschenbaum, 2010).

Parents of students who were enrolled in the immersion program were asked to volunteer to follow the 3-1-8 guidelines of the program at home while their children were learning these same guidelines at the boarding school. Parents actually participated in a “parallel behavior change model” (Kirschenbaum et al., 2011, p. 92). While their children at the boarding school learned 3 of the 3-1-8 guidelines – to eat very low fat, walk 10,000 steps/day, and self-monitor their behaviors – parents were asked to commit to doing this at home. While students at the boarding school learned the 1 of the 3-1-8 program which is how to develop a healthy obsession, parents were asked to do the same at home. While children at the boarding school learned the 8 of the 3-1-8 guidelines, parents were asked to follow these same eight steps at home: (1) make a decision; (2) know the enemy – biology; (3) follow the seven elements of eating (eat very low fat, controlled sugar, frequent protein, low density, high fiber, eat calories – don’t drink them and be calorie conscious); (4) find lovable foods that love you back; (5) move to lose; (6) self-monitor and plan consistently; (7) understand and manage stress – with and without food; and (8) make a healthy obsession last a lifetime – slumps and slump busters.

Parents learned these guidelines and followed through with them without the benefit of being in the long-term weight loss immersion program through the following supports provided by the program. On the same day the students arrived to begin the first semester, parents participating in the study committed to be present on campus for an orientation that provided them with the tools and instructions they needed to begin the

parallel behavior change at home. The first tool provided to parents was a book that explains the program, provides a menu plan, recipes, shopping lists, decision-making support, activity planning, self-monitoring instructions, and a BMI calculator (Kirschenbaum et al., 2007). The next item given to parents was a book to help them self-monitor that lists the calorie and fat content of most any food they might choose to eat and includes a guide to 200 national chain restaurants for planning how to successfully eat outside the home (Boruskek, 2012). In addition to these two books, parents were given self-monitoring journals designed specifically for the long-term weight loss immersion program that was studied; these journals prompt the user to document their daily fat consumption, their daily calorie consumptions, the number of steps they walk each day, what type of exercise they do, how much effort they put in, and their thoughts and reflections for each day. The final tool provided to parents was a pedometer that they could wear to count their daily steps.

At the initial orientation on the first day of school, parents were given each of these four tools along with clear instruction on how to use them. Beginning the second week of school, parents received a weekly phone call from their child's therapist (behavioral coach). This weekly call provided parents with an update on their child's progress in the program and provided support and encouragement of parents' participation in the program. In addition to the initial orientation and weekly calls from therapists, parents attended a mini-immersion parent workshop at the boarding school in October to further support them in following through with their participation in the 3-1-8 guidelines of the program. Students called home twice a week beginning the second week of school to share their progress with their parents and these calls were an opportunity for mutual encouragement and mutual sharing of what they had learned about

following the 3-1-8 principles. In addition to these calls, once a month therapists facilitated a family phone call in which parents and their child spoke with the therapist to plan visits home; this therapeutic call provided the opportunity to address more difficult questions and problems the parent or child might have been experiencing. Finally, visits home offered a learning experience for both parent and child as they worked through how to apply the 3-1-8 principles when students leave the safety of the controlled environment of the boarding school and return to their home community where they encounter the obesogenic environment (Bleich et al., 2011; Carels et al., 2010; Lueke, 2011; Thompson, 2010; Wickens-Drazilova & Williams, 2011).

Frequency of home visits is determined by a student's progress in the 5-tier level system at the therapeutic boarding schools. The level system protects students from leaving campus before they are ready to meet the challenges of returning home for a visit where they will be dealing with the obesogenic environment at home or in their community. Each of the five levels provides increasing expectations to demonstrate personal and community responsibility, and each level has privileges commensurate with the level of responsibility. The goal is to teach students that they are responsible for their behavior, that their behavior impacts others, and that their behavior leads to desirable or problematic outcomes depending on the choices they make (Kirschenbaum, 2005). Hopefully students learn that the more they demonstrate responsibility, the more they rise in the levels and the greater privileges they earn at each higher level.

All students start at the first level when they arrive on campus. The first level does not allow for students to leave campus and has minimal responsibilities and privileges to protect students while they are adjusting to being away from home and learning the 3-1-8 program expectations. Students can graduate from this level in as little

as 2 weeks by completing an application to be promoted to the second level.

An application is required for each promotion to the next level; signatures of multiple staff members and students endorsing the progress made by the applicant are required on every application. Each level application requires applicants to demonstrate increasing mastery of the 3-1-8 guidelines, especially demonstrating accurate self-monitoring. Applications also track progress in fulfilling program responsibilities and academic progress. Student essays demonstrating increasing levels of self-awareness must accompany each application. The second level allows students to leave for one weekend a month and the third, fourth and fifth level allow students to plan increasingly frequent weekend trips home based on the student's level and the recommendation of their individual therapist.

The individual therapist for each student, also known as a behavioral coach, discusses visits home well in advance of the actual departure from campus. Typically, the therapist notifies the parent of the student level promotion and the accompanying privileges to leave campus; the therapist works with the parent to help them prepare the home environment (food, support, and family functioning) and to encourage parents to model desired behaviors during the visit home. The therapist and the student individually discuss how the student can manage challenges he or she may encounter at home and plan for all contingencies. The therapist facilitates the monthly family phone call to prepare the student and their parent together to enjoy their time together at home but to be prepared with a plan for managing the challenges of following the 3-1-8 guidelines outside the controlled environment of the weight loss immersion program.

These visits home provide a significant learning opportunity for both parent and child. Each visit offers the opportunity to practice the skills both parents and their child

have been developing in this parallel behavior change model. The parent orientation, use of tools (instructional book, fat and calorie resource book, self-monitoring journal, pedometer), weekly calls from the therapist, twice weekly calls with the student, mini-immersion parent workshop, monthly therapist facilitated family calls, and home visits all worked together to prepare parents to follow 3-1-8 guidelines at home.

The final way parents learned the 3-1-8 guidelines and were provided with the support to follow through with these behavioral changes without the benefit of being in the weight loss immersion program was a closure meeting at the end of the study. The original plan was for this researcher (Licensed Clinical Social Worker), the program clinical director at the southeastern facility (Licensed Professional Counselor) and the president of the organization that operates the boarding schools (Licensed Psychologist) to meet with parents after all the data were collected and provide an opportunity for parents to share their experiences, work through frustrations and problems, and create a plan for continuing the parallel behavior change process after the study. However, due to unforeseen circumstances that are discussed in Chapter 4, the final meeting at the southeastern school had to be cancelled and the meeting at the western school took place without this researcher present; but the clinical director at that facility and the president of the organization that operates the boarding school (Licensed Psychologist) were present to facilitate the meeting with the parents from the western facility who attended.

The parallel behavior change model has been used in similar studies (Hinkle et al., 2011; Kirschenbaum et al., 2011); in these studies, parent reports of adherence to 3-1-8 principles and parent weights were collected as a critical piece of data; however, self-reports from parents were the source of the data. Kirschnbaum et al. (2011) referred to these self-reports as a weakness of the studies. This study had professionals weighing

parents at the immersion treatment facility. Parents volunteered to be weighed at the immersion program when they dropped off their child on the first day of the immersion program, 5 to 8 weeks later when the immersion program provided a mini-immersion parent workshop and when the study concluded 10 to 16 weeks after the initial weigh in. At the mid and end point of the study, parent self-monitoring was measured by professionals at the immersion treatment facilities. These parent behavioral changes of losing weight and self-monitoring were significant parts of this study and may have a significant relationship to children's successful weight loss.

Parent participation is defined as first, committing to make these changes in individual behavior (3-1-8 guidelines outlined previously), i.e., modeling desired behaviors; and second, committing to make changes to the home environment. Changes in parent weight/BMI and parent self-monitoring were used as indicators of parents' individual behavioral changes. Changes parents made in the home environment were measured by (1) the presence or absence of high fat foods and the increase of low fat or nonfat foods over time, (2) changes in perceptions of family supports, and (3) changes in perception of family functioning. Student success was measured by changes in weight/BMI and student self-monitoring. Students also reported their perceptions of the home environment regarding the food available in the home, family supports, and family functioning.

This chapter is organized into eight sections: Research Design, Research Sample/Participants, Instruments and Procedures, Data Collection, Data Analysis, Role of the Researcher, Limitations/Delimitations, and Summary.

Research Design

This study is a quantitative correlational study. A correlational study looks for the

relationships between variables and the degree to which they relate (Creswell, 2012). In this case, the independent variables are parent weight loss, parent self-monitoring, self-reports of the food available in the home, perceptions of family support, perceptions of family functioning; and the dependent variable is student weight loss. This study used a pretest/posttest design with an intervention; the intervention for parents consisted of the initial parent orientation, use of tools (instructional book, fat and calorie resource book, self-monitoring journal, pedometer), weekly calls from the therapist, twice weekly calls with the student, mini-immersion parent workshops, monthly therapist-facilitated family calls, and multiple weekend home visits with their child over the 10- to 16-week time period of the study. The intervention for children consisted of ongoing participation as a student in the weight loss immersion program at the boarding school over the 10- to 16-week study; therapists at the school gathered data on the student progress in the program through the weekly student weigh ins and weekly collecting and evaluating of student self-monitoring journals.

The pretest was done when the parent and child arrived at the program and included both the parent and child independently completing five steps: (1) the weigh in, (2) height measurement to calculate BMI, (3) the Food Checklist, (4) the Social Support Survey, and (5) Family Survey (GF). The posttest consisted of repeating these five steps with the addition of collecting and evaluating parent self-monitoring journals at the conclusion of the study. These five steps plus the collection and evaluation of parent self-monitoring journals were completed at the midpoint of the study as a means of improving statistical power. Once all data were collected, parents were given the opportunity to discuss their experiences in the study at the closure meeting at the western school with Dr. Daniel Kirschenbaum; or, if they were unable to attend that meeting, they

could discuss their experience in the study by phone with this investigator. The purpose of this final meeting and calls with this researcher was to give parents an opportunity to share their insights and process any questions or concerns that might have been unresolved. Excerpts from these group discussions and one-on-one conversations have been used anecdotally in Chapter 5 of this dissertation for the benefit of the audience and future research.

The rationale for using this pretest/posttest correlational study design comes from the work of other researchers seeking to determine the degree of relationship between similar variables, particularly the relationship between parent weight loss and children's weight loss (Hinkle et al., 2011; Kirschenbaum et al., 2011). Hinkle et al. (2011) correlated camper weight loss with parent weight loss from the end of a short-term weight loss immersion program of 4 to 8 weeks (pretest) with 8 to 12 month follow-up and 1 to 1½ year follow-ups after program (posttest). This pretest/posttest correlational study also used the family functioning tool used in this study (Appendix D) and a food recall questionnaire, in addition to parent self-reports of their weight and their children's postcamp weight. Kirschenbaum et al. (2011) correlated camper weight loss with parent weight loss in a similar pretest/posttest correlational design that included use of the family functioning tool used in this study (Appendix D).

Research Sample/Participants

The target population for this study was parents. This is based on the multiple elements of the problem statement that many parents (1) are unaware of the epidemic of obesity or the health dangers related to it (Boon & Clydesdale, 2005; Hughes et al., 2005); (2) are often at a loss as to what to do about it if they do become concerned about their child's weight (Barlow et al., 2002); (3) tend to demonstrate a lack of motivation to

change their own behavior (McFarlane et al., 2009); (4) tend to believe they have no power or ability to positively impact their children's weight loss despite evidence that "parent food choice, eating style, activity level, and screen time are all influences on how children will behave in relation to food intake and physical activity" (DeMattia & Denney, 2008, p. 96); and (5) can positively impact children's weight loss by structuring the household environment to include regular family meals together, consistent routines such as regular bedtimes, removing computers and TVs from children's bedrooms (Spruijt-Metz, 2011), putting limits on screen time (Thompson, 2010), facilitating physical activity, preparing food using healthful, very low fat cooking methods, and serving food in appropriate portions (Kirschenbaum et al., 2007).

The questions answered in the study center on parent behavior in relationship to children's weight loss in a long-term weight loss immersion program. If parents change their behavior by losing weight, self-monitoring, eliminating high fat foods and increasing low and nonfat foods in the home, increasing supports at home, and enhancing family functioning, how does that impact children's weight loss? Parents who send their children to either of two small for-profit therapeutic boarding schools that provide an intensive weight loss immersion program were recruited for this study of the relationship between parent participation and student success in a long-term weight loss immersion program. The southeastern school can accommodate up to 50 students and the western school can accommodate 80 students; generally, the enrollment in the southeastern has been between 35 and 40 students at any given time and the enrollment in the western school has been 55 to 65 students over past years (Clinical Director, 2011). Parent participation was expected to be about 20 parents based on previous research studies with similar parent demographics (Hinkle et al., 2011; Kirschenbaum et al., 2011); however,

there were unexpected factors negatively impacting this sample size that are discussed in Chapters 4 and 5. Other family members (siblings, grandparents, aunts, and uncles, etc.) who wished to participate were encouraged to do so and one sibling did participate initially, but this data was not significantly considered in the study since he was not fulfilling the parenting role in the child's life.

Parents who were not overweight were encouraged to participate in the study; three of the participating parents were not overweight and were welcomed to participate as a way of learning the program and encouraging their child. Their weight could not be considered in the study because there was no way to measure a change in their weight if they were already at a healthy weight. The other factors (self-monitoring, food checklist, family supports, and family functioning) were the variables considered with these healthy weight parents. The study proceeded with a very small number of parent volunteers although the hope had been to have at least 20 overweight ($BMI \geq 25$) parents participate. Based on the review of the literature, even with the very low number of participants, this study is worthwhile because it is the first time that a study on the relationship between parent participation and children's weight loss has been done at a long-term weight loss immersion program and the first time parent weight and parent self-monitoring have been professionally measured at the facilities as part of the study. This plan for measurement at the facilities reduced the potential for invalid data given that self-reports can sometimes be unreliable. In other similar studies, parent self-reports as valid data points have been cited as a weakness (Kirschenbaum et al., 2011).

It should be noted that in terms of demographics, typically mothers tend to volunteer to participate for his type of study in significantly greater numbers than fathers (Heinberg et al., 2010; Kelly & Kirschenbaum, 2010; Kirschenbaum et al., 2011). The

socioeconomic status of most of the families who send their children to these private, for-profit boarding schools are upper middle class and above; a much higher income level is required in order to be able to afford to send a child to these private boarding schools. There have occasionally been students from lower income families who have attended through state funding; in two cases this funding was provided by the child protective service agency in the child's state (Clinical Director, 2011). In these two cases, funding was provided due to the child being in danger of serious medical complications including death due to parental medical neglect; these children were super morbidly obese, meaning they had 100 to 200 pounds or more to lose to get to a healthy weight which constitutes a life-threatening medical condition. One of these children was Caucasian, the other was African American (Clinical Director, 2011). Caucasians are well represented at the schools with a small percentage of American Indians and an even smaller percentage of African Americans having attended at the southeastern school at different times since the school was founded in 2007 (Clinical Director, 2011). The higher percentage of American Indians at the southeastern school was due to an agreement with two American Indian tribes in the southeastern United States to provide services to the obese adolescents in their communities (Clinical Director, 2011).

The sampling method in this study is a "convenience sampling," meaning this researcher selected participants "because they are willing and available to be studied" (Creswell, 2012, p. 145). In this case, the researcher had a close association with the immersion treatment program under study and had permission from the president of the organization to conduct the study (see Chapter 1 Introduction). All parents were invited and encouraged to participate. No material incentives were offered; however, parents were provided with information on the latest research that highlights the benefits of

parent involvement to promote student success. Some parents were willing to commit to participate as a way of demonstrating support for their child. Some parents were not willing to commit to the study for reasons cited in the literature: lack of motivation to change their own behavior (McFarlane et al., 2009) and a belief that changing their behavior would not have an impact on their child's weight loss (DeMattia & Denney, 2008). One parent volunteered for the study but then gained 9.2 pounds and verbalized both a lack of motivation and a lack of understanding of the impact of his behavior on his son's behavior; his story is discussed in full in Chapters 4 and 5. This former clinical director of the long-term weight loss immersion program at the southeastern school has also observed that parents tend not to participate out of guilt or fear of being criticized for not having done more for their child. They do not believe it is necessary to commit to the 3-1-8 guidelines or change their own lifestyle to accommodate their children; they do not believe in the program or want it imposed on them (Clinical Director, 2011). This parental attitude was also evident during the study.

Instruments and Procedures

Six instruments were used to measure variables in this study: (1) weight scales with capacities of up to 600 pounds, (2) BMI calculators, for adults found at the CDC website (CDC, 2011b) and for children found at the Wellspring website (Wellspring, 2010) (3) self-monitoring journals, (4) the food checklist to measure high fat and low or nonfat foods currently available in each home, (5) the Social Supports Survey for Diet and Exercise Behavior, and (6) the General Functioning (GF) subscale of the McMaster Family Assessment Device (FAD). Each of these instruments was completed by parents and students independently; the descriptions of each of these instruments including source, reliability and validity, its specific use in the study, and when it would be used is

explained in the following section.

One of the most significant variables to be measured, the central measure of the study, was the weight change of the children and the participating parents. The scales used are located at the immersion treatment facilities and were operated by trained professional therapists at the facility. The scales weigh up to 600 pounds and are regularly calibrated by the therapists using standards weights from the weight room located near the area where students are weighed in weekly. Students were weighed in once a week as part of their immersion program; parents were weighed and their height measured (for calculating BMI) by therapists at the school when they dropped off their child, when they attended the parent workshop weekend at the midpoint of the study, and when they attended the closure meeting at the conclusion of the study. Those who could not attend the closure meeting or who were part of the study at the southeastern school where the closure meeting was cancelled were weighed at their doctor's office, at their local fitness facility, or on their scale at home. Some parents participated for as few as 10 weeks and some for as many as 16 weeks depending on which school their child attended and how early they volunteered; the original study was planned for 16 weeks but was modified to include as many parents as possible due to the challenges in recruiting an adequate sample size (which are discussed in more detail in Chapters 4 and 5).

The CDC (2011a) determined a range for underweight, healthy weight, overweight, and obesity using BMI. BMI is a well-accepted measure for determining obesity (DeOnis & Lobstein, 2010). To calculate BMI for adults, divide weight by height squared and then multiply by a conversion factor of 703. A BMI under 25 is considered healthy, while a BMI of 25 to 29 is considered overweight, and a BMI of 30 or above is considered obese. While calculating adult BMI is fairly simple, calculating BMI for

children and adolescents requires factoring in age and making allowances for growth. In this study, the adult BMI calculator at the CDC (2011b) website was used, and the children's BMI was calculated using the Wellspring Academies (2010) BMI calculator; other information on assessing BMI can be found on the CDC (2011a) website. BMI was calculated by therapists at the school at the same times as parent weights and heights were collected: August 20-September 10, October 6 or 13, and November 17 or 20, 2012.

The self-monitoring journal was another important instrument in collecting data for this study; the same self-monitoring journal used by students at the school was also used by parents in this study. The organization that operates the long-term weight loss immersion boarding schools that were studied created a specialized self-monitoring journal uniquely designed for the program. Each self-monitoring journal has room for approximately 30 days of journaling in a format of two pages for each day. The left page asks those who are completing the journal to write the day and date, the number of steps they completed that day, the other forms of activity in which they participated, all foods eaten that day (fat and calories for breakfast, lunch, dinner, and snacks) and totals of fat and calories for the entire day. The page to the right of this page gives the person journaling prompts to rate their effort for the day, share their thoughts about the day, and draw conclusions from what they see in the day's self-monitoring to plan for how to maintain or increase their success in future days.

Self-monitoring is a significant strategy used in cognitive behavioral therapy, especially in relation to weight loss (Rich, 2004) that has been associated with improvements in weight loss and helping sustain behavioral change efforts to be consistent with goals (Kirschenbaum, 2005); self-monitoring has been included as a significant variable in multiple studies on adolescent weight loss (Hinkle et al., 2011;

Kelly & Kirschenbaum, 2010; Kirschenbaum et al., 2011). In this study, self-monitoring journals of both parents and children were collected and evaluated. Parent self-monitoring journals were collected during the parent mini-immersion workshops in October and when parents were on campus for the closure meeting at the western facility on November 17 or for the final day of operation of the southeastern facility on November 20, 2012.

Parents were given self-monitoring journals along with clear instructions on how to complete them at the initial orientation and were reminded to bring the completed self-monitoring journals to the October and November weekends; reminders were sent by the clinical directors at the facilities prior to the October workshops and the closure meeting in November. Self-monitoring journals of students were evaluated weekly in cognitive behavioral therapy group at the school by the therapist facilitating the group and the other students in the group. Both parent and student self-monitoring journals were evaluated on number of words written in the journal for each week, whether or not the number of steps was entered in the journal, and whether the fat and calories of at least three foods had been entered for each day. Parent journals were collected and evaluated while parents were in meetings at the October workshops and during the closure weekend November 17 at the western facility; two therapists independently evaluated the journals and compared their results to build in reliability.

The food checklist (see Appendix A) is another important instrument used in this study. It is a two column, 41-item survey of the foods currently available in the home. It was recently used successfully by Sampat (2011) in a study on the impact of social supports and self-confidence on student success in an immersion treatment program. Patterson et al. (1997) demonstrated the “validity of the household food inventory as an

indicator of household members' diet practices" (p. 274). It was validated for by Fulkerson et al. (2008) in their study *Validation of a Home Food Inventory*. This survey contains both high fat (not recommended by immersion program) and low fat or nonfat foods (recommended by immersion program) as opposed to only foods used in specific interventions (Fulkerson et al., 2008). The food checklist was administered to parents by therapists at the western school and by this researcher at the southeastern school in August/September (initial), October (midpoint), and November (final) and to students by therapists at the school independently of their parents within days of their parent(s) completing it so that the parent and child surveys could be compared within the same time frame.

The Social Supports Survey for Diet and Exercise Behavior (see Appendix B for parent version and Appendix C for the student version) is the fifth instrument that was used in this study and was developed by Sallis et al. (1987) for the purpose of measuring perceived social supports as "an important determinant of success in changing health habits" (p. 825). Sallis et al.'s study indicated that the survey has validity and reliability based on positive correlations between social support factors and reported health habits and the strong relationship found between social supports and health habit changes (Sallis et al.). This 20-item survey has two columns for responses, one for family support and one for friend support. In this study, the primary interest is measuring family support, but the friend support column offers an opportunity for both parents and children completing the survey to carefully consider their responses in comparing the expected behavior of family members with the expected behavior of friends.

This instrument was also recently used by Sampat (2011) in her study on the impact of social supports and self-confidence on student success in an immersion

treatment program. Parents and students each completed their own version of the Social Supports survey; the parent version is in Appendix B and the student version is in Appendix C. This survey was administered to parents by therapists at the western school and by this researcher at the southeastern school in August/September (initial), October (midpoint), and November (final) and to students independently of their parents at the school within days of their parent(s) completing it depending on the therapists schedule with the students.

The final instrument that was used in this study is the GF subscale derived from the 53-item FAD (Byles et al., 1988; Epstein et al., 1983; see Appendix D). The FAD has proven to be a reliable instrument for assessing family functioning using seven different scales: (1) General Functioning, (2) Problem Solving, (3) Communication, (4) Roles, (5) Affective Responsiveness, (6) Affective Involvement, and (7) Behavior Control (Epstein et al. 1983). The GF offers a shorter assessment that is easier to administer and score but maintains a high correlation to the FAD (Byles et al., 1988). In this 12-item instrument, six items are worded to describe healthy functioning and six items are worded to describe unhealthy family functioning; each closely aligns with the longer FAD. The GF has been used with confidence as a valid measure of family functioning (Byles et al., 1988). This survey was administered to parents by therapists at the western school and by this researcher at the eastern school in August/September (initial), October (midpoint), and November (final) and to students by therapists independently of their parents at the school within days of their parent(s) completing it to provide an accurate comparison between parent and child perceptions within the same time frame.

Data Collection

The weight and height data was collected at the immersion treatment facilities by the therapists or clinical directors at the facility except for the final collection for two parents who were unable to attend the western facility closure meeting on November 17 and three parents who were not able to be at the southeastern facility on November 20; this researcher collected the data for the five parents who were unable to be present for these final weigh ins. Weight data for students were collected each week by one of the therapists and transmitted electronically within the facility to the other therapists. Weight data for parents were collected by the therapist assigned to the student whose parents had chosen to participate. The student and parent(s) were weighed by the assigned therapist separately and privately to protect confidentiality. Therapists did not inform parents of student's weights or students of parent's weights. Parents and students were assigned numbers by the clinical director of the facility to ensure anonymity; this researcher received data without names but with the numbers the clinical director had assigned to protect the private information of the subjects except at the end of the study when this researcher had to become more involved in weight data collection for parents who could not be at the facilities during final data collection.

While students were weighed each week and had their height measured approximately every 6 to 8 weeks, parents were weighed and their height measured three times over the 10- to 16-week study: when they dropped off their child at the immersion program initially, when they attend the parent workshop in October at the half way point in the study, and when the study concluded in November/December. The food checklist, social support survey, and family survey were completed by both parent and child independently at each of these three times; parents completed these surveys at the times listed above, while students completed them based on their therapists scheduled time with

them on or near the times parents completed the surveys. Therapists at the western facility distributed the surveys, collected the surveys, and coded them with the numbers assigned by the clinical director of the facility prior to giving them to this researcher; at the southwestern facility, this researcher distributed, collected, and coded surveys on August 20 and October 13 due to the limited staff available at that facility.

At the end of the study, after most data were collected, a meeting of parents and the president of the organization that operates the school (licensed psychologist) was held at the western facility on November 17, 2012, with the clinical director at that facility present to help collect final data and facilitate the meeting. This meeting gave the parents an opportunity to share their experiences, especially related to what insights they would like to pass on to other parents who have overweight or obese children. The purpose of this meeting was to allow parents the opportunity to process some of what they had experienced out loud with other parents and a licensed psychologist present to work through any lingering concerns or unresolved challenges they had encountered. Several days after the meeting, this researcher spoke with the clinical director and later with the president of the organization to confer on what information was gained from the meeting. This researcher also spoke by phone with parents who were unable to attend this meeting to gather their reflections and insights from their experiences in the study. This information is shared anecdotally in the discussion for this study in Chapters 4 and 5.

Data Analysis

The primary focus of this study is the relationship between parent participation and student success in a weight loss immersion program. Student success is measured by the weight loss and change in BMI over the 10- to 16-week study. Parent participation is measured in five ways: (1) changes in weight/BMI, (2) self-monitoring, (3) changes to

the food available in the home (food checklist), (4) changes to the support in the home (social support survey), and (5) changes in family functioning (family survey). Parent change in body weight was calculated from the initial weigh in at the immersion facility in August/September to the final weigh in at the facility in November (or for some parents who were not able to be at the facility for the final weigh in in November, weights were gathered later either from a doctor's office weigh in, a weigh in at a fitness facility, or a weigh in at their home). There were also measurements taken at the half way point in October at the parent workshops to improve statistical power.

In order to answer the research questions about relationships between student weight loss and each of the five independent variables, a correlation analysis was used to look for relationships or co-variation between the dependent variable of student change in body weight and the independent variables: parent change in body weight, parent self-monitoring, self-reports of food available in the home, perceptions of family support, and perceptions of family functioning. To determine if these variables correlated significantly with student change in body weight, this researcher had planned to use a Pearson r with a Bonferoni correction for total numbers of correlations examined, however, the sample size was insufficient to use this statistical analysis (Charles Darwin University, 2004). The Spearman Rank Correlation is similar to the Pearson r but is not as affected by smaller sample size (Michigan State University Nursing Program Course Materials, 2002). The Pearson r is a parametric measure, meaning it is a measure that makes certain assumptions about the parameters of the sample; some of these assumptions include having a large sample and a normal distribution (Eubank, 2001). The Spearman ρ is a nonparametric measure which does not require a large sample size or a normal distribution (Charles Darwin University, 2004). Normal distribution in

simple terms means that the data is symmetric or creates a bell shaped curve with a single peak with almost all values falling within three standard deviations of the mean (Narisimhan, 2006).

The parent participants who were initially overweight ($BMI > 25$) were used in the correlation analysis of the first of the five independent variables: parent weight loss/BMI change. Parent participants who were at a healthy weight ($BMI < 25$) were not compared since they did not have weight to lose but were instead analyzed within the last four independent variables (parent self-monitoring, self-reports of food available in the home, perceptions of family supports, and perceptions of family functioning). However, the first attempt at finding a correlation between student weight loss and parent weight loss did not show any correlation as discussed in Chapter 4, and therefore no further correlation calculations were attempted and the data were analyzed by looking for patterns and changes that may be of benefit to future researchers given that this is a pilot study. These results are provided in Chapter 4 and discussed in Chapter 5.

Role of the Researcher

This researcher discussed the specifics of the study with the president of the organization that runs the immersion treatment program and received his permission to conduct the study. He required this researcher to be in close contact with the clinical director and the executive director of the facilities to plan the study carefully in advance. This researcher completed the following steps after Gardner-Webb University Institutional Review Board approval.

The researcher composed a letter to recruit parents who were sending their child to the immersion treatment program in the fall of 2012. This letter was reviewed by the president, clinical director, and executive director; each of these individuals provided

their input to ensure that the letter maintained the integrity and fulfilled the responsibilities of the organization. The letter was not used until it had their approval.

This recruitment letter was sent to all families inviting all parents to participate in the Parent Participation study. No incentives were offered. The letter was sent out from the facilities with the signature of the executive director for the southeastern facility initially, but later it became more efficient to have the clinical directors at each facility send out the letter; the letter was printed on company stationary to ensure that parents understood that the research was legitimate and approved by the organization. In order to provide adequate time for parents to process the letter prior to the start of the fall semester, the letter was sent soon after July 16, 2012, along with the release and three surveys for parents to review: food check list (1 page), Social Supports Survey (2 pages), and Family Survey (1 page). Parents were provided with these surveys so they would be aware of the expectations for the study, but they were not asked to complete the surveys until they agreed to participate in the study.

Prior to the start of the school year, this researcher called all of the families to whom the recruitment packet was sent. The purpose of this call was to make sure families received the packet, answer any questions they may have, encourage participation, clarify any details that may have been overlooked, and explain how the parents' private information would be protected. The hope was that this call would provide an opportunity for parents to be reassured that the study was for the benefit of their family and to advance research in addressing the childhood obesity epidemic. Parents were provided with verbal information on the obesity epidemic and were e-mailed further information at their request. This researcher also obtained a verbal commitment of participation from those parents who wished to volunteer and reminded

parents to read and sign the release for the study and return it to this researcher in person on August 20 or through the staff at the facility at the parents' convenience.

Due to very low enrollment at the southeastern facility which was initially the only site where this study was to take place, this researcher received permission from the president of the organization to add the other long-term weight loss immersion school located approximately 2,500 miles away in a western state as a second site for the study. This researcher followed up with the clinical director at that western facility several times by phone from late August to early September 2012 to explain the study and procure her support; she was very receptive and expressed her enthusiasm for providing the support required to collect data and maintain the privacy of the parents. This researcher was physically present for parents at the southeastern facility initial meeting August 20, 2012, but was unable, due to distance and expense, to be present for the parents at the western facility.

The clinical director at the western facility agreed that she would take on the role of providing in-person support and encouragement to the parents and answer any of their questions concerning the study along with all data collection activities. She also asked to take on the role of making phone calls checking in with parents to answer any last minute questions, confirm their decision to participate or not participate, and remind them of how their privacy would be protected during the study. This researcher stayed in touch with the clinical director at the western facility via phone and e-mail throughout the study and after the study was completed as follow-up information was needed.

This researcher was not part of data collection at the western facility except for calls to two parents at the end of the study which is further explained in Chapter 4; all other data received from that facility were coded by the clinical director there based on

the coding system she created and sent via secure e-mail or at the end of the study through the postal service. However, at the southeastern facility where enrollment was very low, this researcher was more involved in data collection due to limited staff available at that facility to assist in the process of data collection. Other clinical staff were laid off or reduced to part-time due to the very low enrollment, so the clinical director was the primary clinical staff available to do weight and height measurements with parents; she measured height and weight for all parents participating in the study except in one case when the parent volunteered for the study after the initial orientation on August 20 and could only be at the facility on the weekend when no clinical personnel were available; therefore, this researcher completed the height and weight measurements with that parent.

Due to the very low enrollment at the southeastern facility, the orientations were very informal and occurred as families arrived with this researcher playing a supportive role in encouraging parents and helping to provide information on the program; parents received program tools (books, self-monitoring journals, and pedometer) and basic information about their supportive role in the program, and then this researcher followed up the orientation with an explanation of the study and strategies to empower parents to begin their participation in the program at home. All three families present at the initial orientation agreed to participate in the study and one additional parent, noted previously, volunteered shortly after the initial orientation; she received all the orientation materials and an informal orientation from this researcher when she visited the campus in September.

Although the original plan was for therapists to distribute and collect surveys at the initial, midpoint, and final meetings, due to the very low enrollment no therapists

were present, and the clinical director in each of these meetings was fulfilling multiple roles; consequently, this researcher took on the role of distributing and collecting surveys directly with the parents. This researcher encoded surveys in front of the parents, demonstrating and assuring them that their information would be anonymous for the purposes of the study but that due to the very small sample size it would be impossible for the researcher to remain unaware of the parents' identities. The parents acknowledged that it was not possible for them to remain anonymous to the researcher, and they stated that they welcomed this researcher's support and encouragement and had no concerns about this researcher being aware of their identities.

From October 5 through 7, the western facility weight loss immersion program provided a mini-immersion experience/workshop to the parents; this researcher was not able to be there for that workshop but was present on October 13 of the October 12-14, 2012, Parent Mini-Immersion Workshop Weekend at the southeastern facility.

Participating parents were expected to be at the workshop prepared to weigh in, submit self-monitoring journals for evaluation, and complete surveys again. This researcher was available to connect with parents in person to answer any questions, provide reassurance of anonymity using the coding system for data, and to provide encouragement to follow through with participation in the study.

On November 17 at the western facility and November 20 at the southeastern facility, parents returned to each campus for the final weigh in of the Parent Participation study; however, not all parents were able to be there on campus for the final weigh in, and this researcher had to collect weight data and other study data directly from these parents who were unable to attend. One parent had information on their weight from a doctor's visit, another from a fitness facility, and several more weighed themselves on

their scales at home to provide final weight data to this researcher.

One parent was able to be on campus for the final weigh in at the southeastern facility and she also completed the three surveys at that time; she had not completed a self-monitoring journal to submit. Parents participating at the western facility who were able to be on campus for final weigh in also submitted their self-monitoring journal if they had completed one so that therapists at the western facility could provide this researcher with an evaluation of their self-monitoring journal; these parents also completed the final set of three surveys which were distributed and collected by therapists at the western facility.

Parents at the western facility were able to participate in a 1½ hour closure meeting on November 17, 2012, with the clinical director of that facility and the president of the organization that runs the facilities. A similar meeting had been planned for the southeastern facility, but it was cancelled for reasons explained in Chapter 4. This researcher had planned to be present at the southeastern facility for this final meeting with the southeastern facility clinical director and president to provide an opportunity for parents to pass along what they had learned to each other and for future research; any unresolved issues or challenges would have been processed so that parents could leave feeling empowered to continue participating in the program to support their child's success. Since this meeting only took place at the western facility and some of the parents participating at that facility could not make the meeting there, this researcher called parents who did not attend the western meeting and could not attend the cancelled southeastern meeting and provided a very informal closure meeting individually over the phone.

Limitations and Delimitations

This study had several shortcomings that limit its generalizability. First, the sample size was very small. The schools where the study was conducted normally have enrollments from 35 to 40 students with a maximum capacity of 50 students at the southeastern facility and from 55 to 65 students with a maximum capacity of 80 students at the western facility (Clinical Director, 2011). This researcher expected a minimum of 20 parents with a BMI ≥ 25 , an estimate based on enrollment expectations and the experience of other researchers conducting similar studies (Hinkel et al., 2011; Kirschenbaum et al., 2011). Such a small sample size limits generalizability but provides potentially valuable information for future research, especially considering that this is the first study of children enrolled in a long-term weight loss immersion program and this is the first study in which parent weights and parent self-monitoring were measured and evaluated by professionals at the long-term weight loss immersion program.

Measuring parents' weights and evaluating their self-monitoring at the facility also has drawbacks in that parents of a middle or lower socioeconomic status may not have had the means to travel to the boarding school for all three required weekends when these measurements/evaluations were completed. Families enrolling their child in the program to be studied are from all over the United States and other countries (Clinical Director, 2011), and the study strength of measuring parent weight and evaluating self-monitoring at the facility could also be considered a study weakness because it potentially excludes parents who do not have the means to commit to traveling to the school for the three weekends required by the study design.

The expectation of this researcher, based on observations from previous years as the clinical director of the southeastern facility, was that the parents who volunteer to participate in this study would be primarily female, Caucasian, in their mid-30s to late

40s/early 50s, and of a higher socioeconomic status; this is the demographic of the majority of the families who have enrolled their children in the school in previous years and the description of the parents who have most actively participated in their child's treatment (Clinical Director, 2011). This expectation was born out in the actual participants in the study and this unrepresentative demographic further reduced the generalizability of the study.

In addition to these shortcomings in the study, there are several possible threats to internal validity or potential problems in being able to accurately infer relationships between the dependent and independent variables in this study (Creswell, 2012). First, the dependent variable in this study is the weight loss of children aged 11-18 enrolled in a long-term immersion treatment program. The weight loss of the students could have been significantly impacted by historical factors, meaning events that occur between pretest and posttest that influenced their weight loss (Creswell, 2012) other than the independent variables being measured in this study (parent weight loss, parent self-monitoring, food available in the home, family support, and family functioning). Second, this age group is maturing at a significant rate cognitively and emotionally due to their developmental stage (Newman & Newman, 1995), and they were enrolled in an intensive immersion program promoting personal responsibility and lifestyle change (Kirschenbaum et al., 2007). These two factors could have led to significant maturation that impacted student weight loss during the study unrelated to the variables being studied.

Parent participants who were not in the controlled environment of the boarding school may also have had their weight loss (or weight gain) affected by events between pretest and posttest that occurred outside the study. Such events were outside the control

of the researchers and may limit the internal validity of the study because they were not necessarily accounted for in the study. There was some limited opportunity to learn about unexpected historical factors parents introduced into the study when parents were asked about this in the final meeting after data collection was completed. However, parents had difficulty identifying “uncontrolled historical factors” (Creswell, 2012, p. 305) impacting their experience in the study; subsequently there is very little information in the final discussion to alert future researchers of these types of potential threats to internal validity.

Parents who volunteered to participate in this study also tended to be “brighter, more receptive to treatment, or more familiar with a treatment” (Creswell, 2012, p. 304). As noted earlier, the expected sample was parents of a higher socioeconomic status – higher income, higher level of education, higher level occupation (American Psychological Association [APA], 2012) who have actively participated in their child’s treatment; this held true in the sample for this study. A more representative, random sample would have been preferable to increase internal validity, but this was a convenience sample of parents who were available and willing to participate. Consequently the sample selection is another threat to internal validity.

Parents’ dropping out of the study was also a potential threat to internal validity. In this study, the hope was that all parents would follow through with their commitment to participate in the study, especially since their children were participating in the long-term weight loss immersion program and benefiting from parent modeling of desired behaviors such as follow through (Newman & Newman, 1995). However, there may have been unforeseen reasons for a parent to drop out, some of which might have been related to not being able to travel to the school on the three required weekends of the

study. However, since parents dropping out for this reason would further reduce an already very small sample size, accommodations were made to allow parents who could not be at the facilities for all the required weekends to have their weight measured at their doctors' office, at their local fitness center, and eventually even at their home. These accommodations were made to avoid further reducing the sample size which had already created difficulty in drawing generalizable conclusions. Ideally, a future researcher would have access to a larger sample size to allow for mortality by comparing dropouts to remaining participants regarding outcome measures (Creswell, 2012), but that was not possible in this study due to the unexpectedly low enrollment in both long-term weight loss immersion programs.

This study also had certain delimitations or planned restrictions of the scope and depth of the study. Planned limitations included the length of the study, the number of variables in the study, and the depth of the study. This study was limited in length due to this researcher's limited time available to complete the study and the scheduling challenges and potential dropout of participants if the study continued through the long winter holiday break. The number of variables was limited to make the study more manageable in terms of time and resources; had there been more time and resources for collecting data, additional variables of level system and academic progress may have been introduced to provide more in-depth understanding of the correlations between student success in weight loss and in these other areas; but the collection of data for each of these variables is significantly more in depth and time consuming. As a result, it was intentionally eliminated from the planning of the study.

Summary

This chapter on methodology has outlined the research design, research setting,

participants, instruments used, procedures followed, data collection to reduce bias and to safeguard anonymity of participants, data analysis, the role of the researcher in this study, and the limitations/delimitations. This is a quantitative correlational study using a pretest/posttest design with an intervention; this researcher had access to two groups – one at a southeastern long-term weight loss immersion program and one at a western long-term weight loss immersion program. The group at the western facility was added after the start of the study and was only available for 13 weeks maximum, and the southwestern group was studied over a period of 16 weeks maximum. The dependent variable, student weight loss over the 16 weeks of the study, was correlated with five independent variables associated with improved student weight loss (Hinkle et al., 2011; Kirschenbaum et al., 2011), parent weight loss, parent self-monitoring, self-reports of food available in the home (food inventory), perception of family support (social support survey), and perception of family functioning (family survey). Anecdotal information from the final parent meeting and final parent phone calls is also included in the results and the discussion of the results in Chapters 4 and 5, respectively.

Chapter 4: Results

Introduction

Chapter 4 provides an explanation of the results of data collection and analysis including statistical methodology and rationale. The chapter begins with a review of unexpected changes to the study timeline and adjustments to data collection procedures and then proceeds with a discussion of each research question; the discussion includes consideration of any unexpected or inconsistent data and an examination of what might have led to any discrepancies in the data. The five research questions are (1) What is the relationship between parent weight loss and weight loss of a child enrolled in a long-term weight loss immersion program?, (2) What is the relationship between parent self-monitoring and weight loss of a child enrolled in a long-term weight loss immersion program?, (3) What is the relationship between self-reports of food available in the home and weight loss of a child enrolled in a long-term weight loss immersion program?, (4) What is the relationship between perceptions of family support and weight loss of a child enrolled in a long-term weight loss immersion program?, and (5) What is the relationship of perceived family functioning and weight loss of a child enrolled in a long-term weight loss immersion program?

The study design summarized in Chapter 1 and presented in detail in Chapter 3 describes a quantitative correlational study focusing on student weight loss in relation to parent participation measured over a 10- to 16-week period beginning in late August and ending in early December 2012, using a pretest/posttest design with an intervention; the intervention is the combination of the family workshop/mini-immersion in October, the ongoing weekly support calls to parents from behavioral coaches, the educational resources (books, self-monitoring journals, pedometers) provided to parents through the

program, and the contact with their child as the child progressed through the program. The pretest and posttest consisted of both parent and child independently completing (1) the weigh in, (2) height measurement to calculate BMI, (3) the food checklist (see Appendix A), (4) the social support survey (see Appendix B), and (5) family survey (GF) (see Appendix C). The parent completed this data to measure their participation; the child completed it to provide the child's perspective on their parents' participation that may also corroborate the parents' perspective. The five measurements above were also measured at the mini-immersion parent workshop in October to strengthen statistical power, and the October workshop provided the first opportunity to measure parent self-monitoring from the start of the study to the half-way point. The original study design planned for measuring all five of the above factors along with parents self-monitoring in the final weekend of the study on December 8, 2012; however, due to unforeseeable changes at the original study site, this plan had to be modified.

Changes to Timeline

The timeline of the study changed due to the unexpected closure of the original study site on November 20, 2012, causing the final data collection meeting scheduled for December 8, 2012 to be cancelled. Data collection occurred from August 20 as planned and the mini immersion workshop took place October 13 as planned with additional data collection at that time, but final data collection occurred remotely for most parents; only one parent was able to be at the facility on November 20 to complete surveys and have a final weigh in. There was not an opportunity to reschedule a final data collection meeting for that time due to the constraints on the facility personnel and limited notice of the closure. Most participants at the original site were involved in the study for 13 weeks but several – either by their request or due to unavoidable delays in collecting data –

participated through December 8, 2012.

Changes to Data Collection

When the first day of data collection took place on August 20, 2012 at the original study site at the southeastern facility, only four students were enrolled at the facility. All four families chose to participate although one of the four parents was unable to be on campus that day and completed initial orientation and data collection with this researcher in early September. Due to the limited enrollment at the original site, a similar facility in a western state operated by the same organization was added on September 1, 2012, and with the assistance of the clinical director there, four more families were added to the study for a total of eight families participating.

However, this facility was experiencing under-enrollment as well which led to restructuring and to the termination of the clinical director at this facility on the 19th of November, 2012. Fortunately, a final data collection meeting did take place on November 17, but only two families attended; the other two families were to be contacted by the assistant clinical director, but this did not occur. This researcher eventually received permission from the president of the organization that operates both study sites to contact the two families directly to obtain final data through parent self-report. Although self-reported weights were originally not to be included in this study, the unforeseeable challenges in data collection and the limited sample size led to the decision to make this modification.

Results for Each Research Question

Results for Research Question 1. The first research question is “What is the relationship between parent weight loss and weight loss of a child enrolled in a long-term weight loss immersion program?” Data collected to answer this and the other four

research questions included basic demographic information such as gender, age, ethnicity, and family income which can be seen in Table 1 below. Specific to the first research question, parents height was measured to calculate BMI, and then parents were weighed on three separate occasions: the initial weigh in (August 20 at the original facility and the first week of September at the added facility), the midpoint weigh in at the October workshop (which took place as scheduled October 13 at the original site and took place October 5 at the second research site) and the final weigh in which took place on November 20 at the original site and November 17 at the second site. Table 1 provides the demographics, initial weight and BMI, and final weight and BMI data.

Table 1

Demographics and Initial and Final Weight and BMI Data for Parents and Students

Participant	Gender	Ethnicity	Age	Family Income	Initial Weight (Lbs.)	Initial BMI	Final Weight (Lbs.)	Final BMI
Parent 1C	M	Caucasian	46	\$250,000.00	233.4	38.0	242.6	39.5
Student 1C	M	Caucasian	13		283.8	45.8	237.6	38.3
Parent 2C	F	Caucasian	53	\$175,000.00	252.6	41.4	242.5	39.7
Student 2C	F	Caucasian	15		205.4	34.2	171.8	28.6
Parent 3C	F	Caucasian	52	\$120,000.00	120.6	22.1	124.0	22.7
Student 3C	F	Caucasian	15		186.4	30.1	168.8	27.2
Parent 4C	F	Caucasian	35	\$109,000.00	244.8	42.0	234.4	39.6
Student 4C	M	Caucasian	13		217.2	33.0	180.0	27.4
Parent 1N	F	African American	35		251.1	39.9	233.0	37.0
Parent 1N	M	African American	42		240.0	34.4	226.0	32.4
Sibling 1N	M	African American	16		166.0	26.8	165.0	25.8
Student 1N	F	African American	15		225.0	37.4	185.0	30.8
Parent 2N	F	Caucasian	49	\$100,000.00	137.5	25.1	135.5	24.8
Parent 2N	M	Caucasian	42		296.5	40.3	292.0	39.6
Student 2N	F	Caucasian	14		188.5	36.8	165.5	32.3
Parent 3N	F	Caucasian	53		124.0	20.0	124.0	20.0
Student 3N	M	Caucasian	15		223.5	31.2	181.0	25.2
Parent 4N	F	Caucasian	53	\$85,000.00	113.5	18.9	113.5	18.9
Student 4N	F	Cambodian	13		231.5	43.7	206.0	38.9

Originally, the methodology as described in Chapter 3 was to use Pearson rs with a Bonferoni correction for total numbers of correlations examined; however, the sample size was insufficient to use this statistical analysis (Charles Darwin University, 2004).

The Spearman Rank Correlation is similar to the Pearson but is not as affected by smaller sample size (Michigan State University Nursing Program Course Materials, 2002).

Pearson is a parametric measure or a measure that makes certain assumptions about the parameters of the sample; some of these assumptions include having a large sample and a normal distribution, while Spearman is a nonparametric measure which does not require a

large sample size or a normal distribution (Charles Darwin University, 2004). Normal distribution in simple terms means that the data is symmetric or creates a bell shaped curve with a single peak with almost all values falling within three standard deviations of the mean (Narisimhan, 2006).

The sample size was further reduced by eliminating the parents who were at a healthy weight; the correlation between student successful weight loss and parent weight loss depends on being able to measure parent weight loss. Parents at a healthy weight do not need to lose weight and were excluded from this measure per the study design as discussed in Chapter 3. A healthy weight range is defined by the CDC (2011a) as having a BMI of 18.5 to 24.9 which includes Parent 3C (BMI 22.1), Parent 3N (BMI 20.0), and Parent 4N (BMI 18.9). Eliminating these three parents from the correlation analysis left a sample size of five. The correlation calculation for weight was based on the five parents who were obese which is a BMI 30.0 and up according to the CDC (2011a) including Parent 1C (BMI 38), Parent 2C (BMI 41.4), Parent 4C (BMI 42.0), Parent 1N-F (BMI 39.9), and Parent 2N-M (BMI 40.3). These five parents (1C, 2C, 4C, 1N-Female, 2N-Male) were ranked along with their children from greatest weight loss/BMI reduction to least weight loss/ BMI reduction (see Table 2 below) because the Spearman rho requires data to be ordinal or ranked (Eubank, 2001).

Table 2

Rankings of Parents and Children Based on BMI Change for Spearman rho

Participant	Rank	Gender	Initial Weight	Initial BMI	Final Weight	Final BMI	Weight Change	BMI Change
Parent 1N	1	F	251.1	39.9	233.0	37.0	18.1	2.9
Parent 4C	2	F	244.8	42.0	234.4	39.6	10.4	2.4
Parent 2C	3	F	252.6	41.4	242.5	39.7	10.1	1.7
Parent 2N	4	M	296.5	40.3	292.0	39.6	4.5	0.7
Parent 1C	5	M	233.4	38.0	242.6	37.4	(9.2)	(1.5)
Student 1C	1	M	283.8	45.8	237.6	38.3	46.2	7.5
Student 1N	2	F	225.0	37.4	185.0	30.8	40.0	6.6
Student 2C	3.5	F	205.4	34.2	171.8	28.6	33.6	5.6
Student 4C	3.5	M	217.2	33.0	180.0	27.4	37.2	5.6
Student 2N	5	F	188.5	36.8	165.5	32.3	23.0	4.5

The results show four parents who lost weight, five students who lost weight, and one parent who gained a significant amount of weight (9.2 pounds). If this had been a sample size of 100, then this participant's significant deviation from the expected outcome might be considered an outlier, but because this is such a small sample size ($n=5$), this participant makes up 20% of the sample and, therefore, cannot be considered an outlier (D. Kirschenbaum, personal communication, March 25, 2013). Parent 1C with an initial BMI of 38 gained 9.2 pounds during the program increasing from 233.4 pounds to 242.6 pounds and raising his BMI by 1.5 points. In the final data collection meeting held at the western facility on November 17, 2012, he reported that this weight gain was a result of not following the program for reasons that will be discussed in greater detail in Chapter 5. For the purposes of this chapter on results, it is sufficient to say that his significant weight gain while his son lost a significant amount of weight (40 pounds) did not support the expectation that a positive relationship exists between parent and student weight loss.

The Spearman rho produced an rho value of -0.05; the Spearman rho is very similar to the Pearson r where the r value is the strength of the correlation; a value of 0.9 to 1.0 is a very high correlation; a value of 0.7 to 0.9 is a high correlation; a value of 0.5 to 0.7 is a moderate correlation; a value of 0.3 to 0.5 is a low correlation; and a value of 0.3 or less is little, if any (linear), correlation (Calkins, 2005). The rho value of -0.05 indicates that there is no correlation between the variables (Calkins, 2005). The following scatterplot (Figure 2) of ranks using the Spearman Rank Correlation provides a visual representation of the lack of correlation.

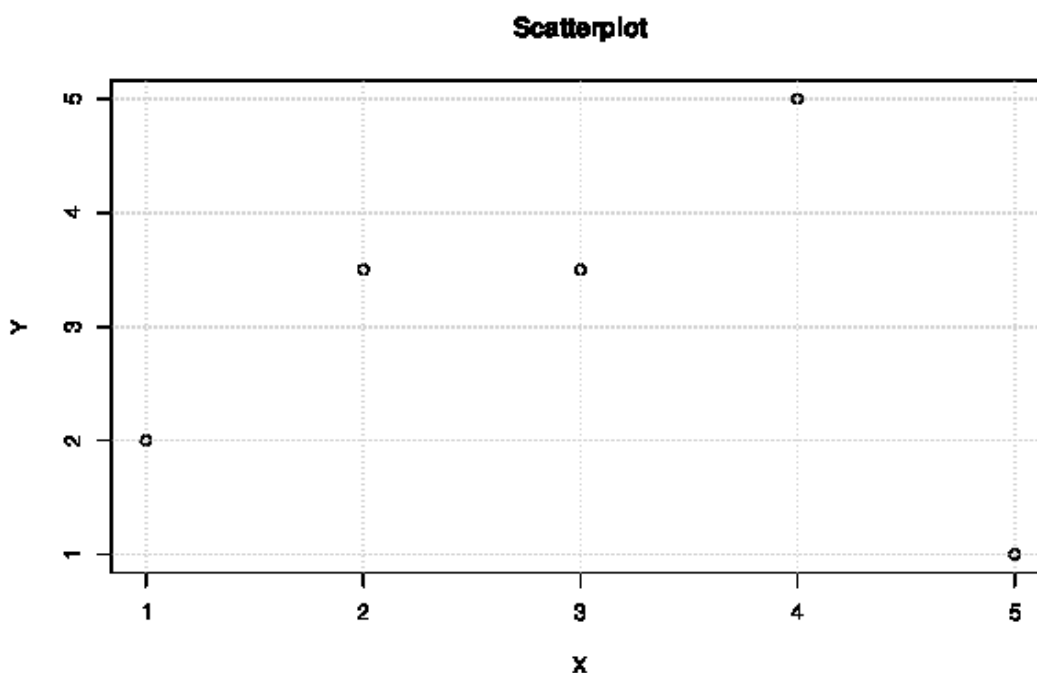


Figure 2. Scatterplot of Spearman Rank Correlation for Five Families with y axis Representing Students and x axis Representing Parents (Wessa, 2012).

Given the lack of correlation in this central measure of the study, correlation calculations were not conducted on the remaining four research questions. Instead, data were analyzed with consideration for potential patterns that might emerge that could be

useful to other researchers for further investigation in future research projects.

Results for Research Question 2. The second research question is “What is the relationship between parent self-monitoring and weight loss of a child enrolled in a long-term weight loss immersion program?” Parent self-monitoring journals were distributed at the beginning of the study so that parents could begin filling them out and have them reviewed separately by two different behavioral coaches both at the midpoint and at the end of the study. The evaluators were given the following instructions at the top of the evaluation tool:

Please write “yes” or “no” under each day to note days the person self-monitoring recorded at least 3 foods with the fat and calorie content (“yes”) and days they did not (“no”). At the end of each week, total the number of days with a “yes” under “#Day SM” (0-7). Write your estimate of the total words written for a week under “#Words”. Write the number of days that steps were recorded for each week under “Steps?” (0-7). When recording totals for the week for either “#Days”, “SM” or “Steps?” records 7 for the first and last week if the individual recorded something every day, even though there are only 6 days in the 1st and last week; this shows they did 100% and avoids skewing the data. (See Appendix E)

At the original facility, one of four parents had self-monitored by the midpoint of the study, while at the second facility, two of four had self-monitored up to the midpoint (October) of the study; however, one of these did not continue to self-monitor after her daughter left the program immediately following the October workshop. By the conclusion of the study, a second parent at the original facility who reported a renewed commitment to lose weight began self-monitoring on the last day of October 2012 and

continued through the end of the study, noting that when she made a commitment to losing weight, self-monitoring helped her to maintain focus on her weight loss program. Although this parent's weekly average is low due to sporadic self-monitoring initially, in the last 2 weeks of the study she self-monitored 6 of 7 days and 5 of 7 days, making a strong finish and losing the most weight of any parent – 18.1 pounds (Parent 1N-F).

In reviewing the data contained in the following table (Table 3), it is interesting to observe that the parent with the highest BMI (42.0) self-monitored for the most weeks (13) of any parent in the study and during those weeks self-monitored for the most days per week of any parent in the study – almost every day with an average of 6.9 days of monitoring per week. Also of note is that two of the four parents who chose to self-monitor were at a healthy weight with BMIs of 22.1 and 18.9, respectively. The students whose parents self-monitored did well in terms of weight loss, but so did the students whose parents did not self-monitor; no clear correlation between parent self-monitoring and student successful weight loss emerged, however, it is important to note that all the students self-monitored, and this may have contributed to their weight loss success.

Table 3

Parent Use of Self-Monitoring Journal (SMJ) with Parent and Child Weight Loss

Participant	Gender	Yes, recorded in SMJ	No, did not use SMJ	# Weeks recording in SMJ	Average #days recording in SMJ	Average #words recorded per week	Average #days steps recorded per week	Weight loss
Parent 1C	M		N					(9.2)
Student 1C	M	Y						46.2
Parent 2C	F		N					10.1
Student 2C	F	Y						33.6
Parent 3C	F	Y		7	3.7	3.6	3.7	(3.4)
Student 3C	F	Y						17.6
Parent 4C	F	Y		13	6.9	0	0	10.4
Student 4C	M	Y						37.2
Parent 1N	F	Y		6	3	0	0	18.1
Parent 1N	M		N					14.0
Sibling 1N	M		N					1.0
Student 1N	F	Y						40.0
Parent 2N	F		N					2.0
Parent 2N	M		N					4.5
Student 2N	F	Y						23.0
Parent 3N	F		N					0.0
Student 3N	M	Y						42.5
Parent 4N	F	Y		10	5.6	31.9	5.5	0.0
Student 4N	F	Y						25.5

Results for Research Question 3. The third research question is “What is the relationship between self-reports of food available in the home and weight loss of a child enrolled in a long-term weight loss immersion program?” To answer this question, a food checklist was completed at the beginning, middle, and end of the study by both the parent and child separately. The hope was that as parents learned more about the importance of reducing full fat foods in the home, the number of full fat foods would decrease and eventually reach zero, while at the same time the low/nonfat foods in the home would increase and eventually reach 23 or 100% of the low/nonfat foods on the food checklist

would be available in the home.

There is no clear pattern to the data contained in the following table (see Table 4 below) that might indicate a correlation between what foods parents make available in the home and student weight loss, but there are some positive results to mention. Several parents increased the available low-fat/nonfat foods in the home significantly – by 8, 10, and 14 points, respectively, over their initial scores. Other parents increased the availability of low-fat/nonfat foods slightly by a point or two and others not at all, but those who did not change were already showing a low score for number of regular/full fat foods in the home and a high score for low/nonfat foods in the home. Overall, in six out of eight families, the ratio of regular/full fat to low/nonfat fat foods was very positive with less high fat foods and more low/nonfat foods, and this number improves to seven out of eight families reporting less regular/full fat foods and more low/nonfat foods as the study progressed.

Table 4

Results of Initial, Midpoint, and Final Food Checklist Survey Completed by Parents and Children Separately

Participants	Gender	Initial Food Checklist		Midpoint Food Checklist		Final Food Checklist	
		Full Fat Foods	Low & Nonfat Foods	Full Fat Foods	Low & Nonfat Foods	Full Fat Foods	Low & Nonfat Foods
Parent 1C	M	13	9	12	12	11	19
Student 1C	M	8	5	0	16	7	7
Parent 2C	F	7	18	6	20		
Student 2C	F	12	14	8	18	10	19
Parent 3C	F	1	15	2	10		
Student 3C	F	4	14	4	15		
Parent 4C	F	5	5	2	19	1	20
Student 4C	M	15	12	15	20	6	23
Parent 1N	F	6	15	3	16		
Parent 1N	M	5	10				
Sibling 1N	M	14	22				
Student 1N	F	7	12	4	12	7	12
Parent 2N	F	5	9	5	10	4	17
Parent 2N	M	6	8				
Student 2N	F	2	20	1	22	1	22
Parent 3N	F	3	13	3	13	3	13
Student 3N	M	7	18	5	21	2	19
Parent 4N	F	8	11	8	11	8	11
Student 4N	F	6	15	3	13	2	18
Healthiest Score:		0	23	0	23	0	23
Unhealthiest Score:		18	0	18	0	18	0

In some families, student perceptions corresponded somewhat to parent perceptions of foods available in the home, but there was significant variation in most families in parent perceptions versus student perceptions of food available in the home. Despite these variations, the final two columns demonstrate positive progress. The final two columns showing regular/full fat and low/nonfat, respectively, have many blanks as noted earlier due to data collection challenges in the final data collection of the study, but

these two final columns also reflect a reduction in regular/full fat foods and an increase in low/nonfat food for all the families who completed the final food checklist. The goal is for the regular/full fat column to have zero, meaning families have zero regular/full fat food in the home and for the low/nonfat column to be 23 or the maximum number of low/nonfat foods contained on the list. All but one family had 10 or less in the “Full Fat Food” column and three students and three parents reported scores from 1 to 4 which are very close to the goal of 0. In the final column for “Low & Nonfat Foods,” three of the five parents who provided final data were within five points of achieving the most desirable score of 23, which indicates 100% of the low/nonfat foods listed on the food checklist are available in the home. Five of the seven students who provided final data reported scores of within five points of the perfect score of 23, and one student reported a perfect score of 23.

Results for Research Question 4. The fourth research question is “What is the relationship between perceptions of family support and weight loss of a child enrolled in a long-term weight loss immersion program?” To answer this question, parents and students were given a social support survey at the beginning, middle, and end of the study. The social support survey measured the participants’ perceptions of how much support the student receives from family and friends, respectively. Parents completed a parent version (see Appendix B) that measured their perceptions of how family members and the student’s friends provide support to the student, and the student completed a student version (see Appendix C) that measured the student’s perception of their family members’ and friends’ support to them as they strove to achieve a healthy weight.

Each statement was responded to using a scale of 1 to 5 (1 = none, 2 = rarely, 3 = a few times, 4 = often, and 5 = very often) rating the students’ family members in one

column and the students' friends in a second column. The first five statements of the survey measured how encouraged the student feels by family and friends. Statements 6 through 10 measured discouraging attitudes and behaviors the person completing the survey (parent or student) perceived to have occurred either by family members or friends of the student. Statements 11 through 20 measured the perceived level of participation by family and friends in supporting the student to engage in exercise.

For the purposes of this study, the perceptions regarding friends are not included because the study focuses on the relationship between parents and their children. The discouragement section of the survey did not show any clear pattern according to student or parent perceptions. Scores ranged from a most desirable score of 5 to a score of 17, and this varied scoring with no apparent pattern was consistent through all three administrations of the survey, therefore, the "Discouragement" section of the survey is not included in the following table. The results shown are the initial, midpoint, and final social support survey data in columns labeled "Encouragement by Family" (Questions 1-5) and "Participation together as a Family" (Questions 11-20). At the bottom of the table, the healthiest possible scores are listed for each column and the unhealthiest possible scores are also listed. In the "Encouragement" section (statements 1-5), statements are worded to elicit higher scores for healthy behavior such as "Compliment me on changing my eating habits" for which a healthiest possible response would be five or "very often" for a total of 25 if all five questions were answered with the healthiest possible score. In the "Participation" section (statements 11-20), the healthiest responses are higher as evidenced by statement such as "Exercise with me" which ideally would be scored as a five or "very often," and if all 10 questions were answered with a score of five each, the total score would be 50.

Table 5

Results of Social Support Survey where Patterns were Noted in Encouragement by Family and Participation in Exercise Together as a Family

Participant	Initial Social Support Survey		Mid-Point Social Support Survey		Final Social Support Survey	
	Encouraged by Family	Participate together as a Family	Encouraged by Family	Participate together as a Family	Encouraged by Family	Participate together as a Family
Parent 1C	18	31	17	24	23	40
Student 1C	18	24	19	38	18	30
Parent 2C	19	47	19	39		
Student 2C	24	50	21	50	25	47
Parent 3C	21	34	19	38		
Student 3C	16	28	17	24		
Parent 4C	24	49	25	48	25	50
Student 4C	17	28	25	50	25	49
Parent 1N	16	34	21	50		
Parent 1N	17	32				
Sibling 1N	12	10				
Student 1N	25	50	23	32	24	34
Parent 2N	23	41	24	39	20	41
Parent 2N	20	42				
Student 2N	23	33	20	44	25	45
Parent 3N	21	28	21	28	21	28
Student 3N	24	39	20	39	24	38
Parent 4N	19	35	19	35	19	35
Student 4N	19	43	16	40	20	40
Healthiest:	25	50	25	50	25	50
Unhealthiest:	5	10	5	10	5	10

Based on the data in the table above, there is a pattern that students perceive family members, in most cases primarily parents, as encouraging as evidenced by an initial survey score average of 20.75 out of a possible 25 or a “grade” of 83% positive perception of encouragement from parents which rose to 92% by the final survey. Parents agreed that they were encouraging as evidenced by increasing their perceived score of encouragement from 80% to 83% to 86% over the three administrations of the

social support survey, but the students' final perception of their parents' level of encouragement was still higher at 92%.

Student perceptions of parent support in exercising showed a positive pattern with the initial grade by students on parent support of exercise being 73% and rising to 81% over the course of the study. The parents were slightly more conservative in their perceptions of supporting their son's or daughter's exercise habits, giving themselves a 75% in the first and second survey which rose only slightly in the final survey to 77%.

In regard to the student and parent perception of friends' support, this study was more concerned with the relationship between parent support and student success, but it was worthwhile to note that in general, both the students and the parents perceived friends as less supportive as evidenced by consistently less desirable scores for friends' support across all three survey administrations with only the exception of one parent and student (parent 1C and student 1C). Overall, students have positive perceptions of parent support that are consistent with parent perceptions of their support. These students lost significant amounts of weight – an average of 33.2 pounds each or an average of 2.6 pounds a week – with the support of their parents according to student perceptions represented in the social support survey.

Results for Research Question 5. The fifth and final research question is “What is the relationship of perceived family functioning and weight loss of a child enrolled in a long-term weight loss immersion program?” To answer this question, the 12-item subscale of the McMaster Family Functioning Scale (see Appendix D) was administered to parents and students at the beginning, middle, and end of the study. This survey assesses general family functioning and is not intended to assess specific areas of functioning; it assesses the overall health of family functioning by offering the

respondent four choices – “Strongly Agree,” “Agree,” “Disagree,” or “Strongly Disagree” – to respond to 12 statements (Byles et al., 1988; Epstein et al., 1983).

“Strongly Agree” is scored as a 1 and all 1s would denote the healthiest possible score of 12 points, essentially stating that a respondent “strongly agrees” that family functioning is healthy; “Agree” is scored as a 2 and all 2s would give a score of 24, suggesting that the respondent “agrees” that family functioning is healthy; “Disagree” is scored as a 3 and all 3s would lead to a score of 36, inferring that the respondent “disagrees” that family functioning is healthy; and “Strongly Disagree” is scored as a 4 and all 4s would provide the worst possible score of 48, implying that the respondent “strongly disagrees” that family functioning is healthy (Byles et al., 1988; Epstein et al., 1983).

When scoring the subscale of the McMaster Family Functioning Scale, the even numbered statements such as “In times of crisis we can turn to each other for support” are scored with a 1 for “Strongly Agree,” a 2 for “Agree,” a 3 for “Disagree,” and a 4 for “Strongly Disagree” without any modification. However, for all odd numbered questions, the items are reverse scored by subtracting the response to the item from 5; for example “We don’t get along together” would illicit possible responses of 1 for “Strongly Agree,” a 2 for “Agree,” a 3 for “Disagree,” and a 4 for “Strongly Disagree,” but in order to make the scoring consistent, if the respondent answered “Strongly Agree,” which is scored as a 1, it would be reverse scored by subtracting the score of 1 from 5 giving a score of 4 which maintains the scoring of 1 being the healthiest score and 4 being the unhealthiest score (Byles et al., 1988; Epstein et al., 1983).

In looking at Table 6 showing the results of the three administrations of the subscale of the McMaster Family Functioning Scale to parents and students independently, the average score overall for all participants (parent and students) for the

initial administration of the survey was 25.0, then 23.4 for the midpoint survey, and 26.0 for the final administration of the survey. These scores hover just above or just below 24 or an average of 2 scored for each statement on the survey denoting “agree” that family functioning is healthy. If the perfect healthy score is 12 and the worst possible score is 48, the respondents in this study appear to be averaging closer to healthy than unhealthy.

At both extremes of the scale, there was one student who scored a 12 with all 1s at the midpoint of the survey after an initial survey score of 25; the final survey score was 14 – just shy of the perfectly healthy score on the midpoint survey. On the opposite end of the scale, one student scored a 48 on her final survey after an initial score of 37 and a midpoint score of 44 signifying a perception of very unhealthy family functioning from this student’s perspective. Her mother demonstrated some similar scoring with 36 on the initial survey and 37 on the midpoint survey, but the mother’s final score was 29 and the father who only completed the survey at the beginning of the study had an initial score of 29. When this set of unhealthy scores is eliminated from the average overall scores of the entire group of participants, the initial survey average is 23.2 which is reduced to 20.9 by the midpoint and further reduced to 19.5 by the final survey, bringing it much closer to the healthiest possible score of 12.

Table 6

Family Support Survey Results Including Initial BMI, Weight Loss and BMI Change

Participant	Gender	Initial BMI	Weight Loss	BMI Change	Family Surveys:		
					Initial	Midpoint	Final
Parent 1C	M	38.0	(9.2)	(1.5)	25	27	24
Student 1C	M	45.8	46.2	7.5	25	17	22
Parent 2C	F	41.4	10.1	1.7	24	24	
Student 2C	F	34.2	33.6	5.6	18	18	17
Parent 3C	F	22.1	(3.4)	(0.6)	26	25	
Student 3C	F	30.1	17.6	2.9	24	27	
Parent 4C	F	42.0	10.4	2.4	25	24	18
Student 4C	M	33.0	37.2	5.6	25	12	14
Parent 1N	F	39.9	18.1	2.9	24	20	
Parent 1N	M	34.4	14.0	2.0	27		
Sibling 1N	M	26.8	1.0	1.0	x		
Student 1N	F	37.4	40.0	6.6	20	19	16
Parent 2N	F	25.1	2.0	0.3	36	37	29
Parent 2N	M	40.3	4.5	0.7	29		
Student 2N	F	36.8	23.0	4.5	37	44	48
Parent 3N	F	20.0	0.0	0.0	24	24	24
Student 3N	M	31.2	42.5	6.0	17	15	17
Parent 4N	F	18.9	0.0	0.0	22	22	22
Student 4N	F	43.7	25.5	4.8	22	19	21
Healthiest Possible Score:					12	12	12
Unhealthiest Possible Score:					48	48	48

If student scores and parent scores are looked at separately, student scores were overall more positive than their parents in terms of their perception of healthy family functioning with the initial survey average score being 23.5 for students versus 26.2 for parents, the midpoint survey average score being 21.4 for students and 25.4 for parents, and the final survey average score being 21.0 for students and 23.4 for parents. If the set of unhealthy scores is eliminated, student average scores initially were 21.6 versus 24.6 for parents; the midpoint survey overall average score for students was 18.1 versus 23.7 for parents; and the final student overall average score was 20.0 versus 22.0 for parents.

With or without the set of unhealthy scores, the pattern remains: student perceptions of family functioning are slightly more positive than their parents' perceptions of family functioning.

Based on the results of the family survey, in seven of eight families both students and parents reported positive family functioning. Though the relationship of perceived family functioning and weight loss of a child enrolled in a long-term weight loss immersion program is unclear, further research using a larger sample may demonstrate that positive perceptions of family functioning may have a positive correlation to student weight loss. Only one family out of eight reported issues with family functioning, and that student lost weight too – not as much as many of the other students – but without a larger sample of more students in her age group with similar BMIs, it would be difficult to determine the relationship between the family issues she experienced and her limited weight loss.

Summary

The results for the five research questions can be summarized in terms of student success in the program related to parent weight loss (question 1), parent self-monitoring (question 2), foods parents make available in the home (question 3), parent social support of student (question 4), and family functioning (question 5) as follows: (1) No correlation was found between parent weight loss and student weight loss due to the limited sample size; (2) four of eight parents self-monitored – all of whom were mothers – and of these, only two monitored most of the week each week that they monitored (5.6 and 6.9 days per week, respectively) for most of the study (10 weeks and 13 weeks, respectively), the other two monitored less than half the week (3.0 and 3.7 days per week) for less than half the study (6 and 7 weeks, respectively); (3) although no clear correlation is apparent

between student success in the program and what foods parents make available in the home, there does appear to be overall improvement over the study with high fat foods found in the home decreasing and low/nonfat foods increasing; (4) students perceive their parents to be supportive, especially in regard to providing encouragement to be successful and to a lesser extent in regard to exercise; and (5) finally, seven of the eight families participating in the survey agreed that their family functioning was healthy.

Looking at the results of the data collected to answer the previous five research questions, there are a number of unexpected results and unexpected changes. By far, the most unexpected result in the data was the lack of correlation between parent weight loss and student weight loss. This was inconsistent with the researcher's expectations. Even with a small sample, the expectation was to see at least some relationship between parent weight loss and student weight loss, but it was also unexpected to have a parent volunteer for the study and then not follow the program at all by his own report and actually gain a significant amount of weight (9.2 pounds).

The low enrollment at the initial research site was quite unexpected. Typically, the enrollment would be 25 to 30 students to start the school year (Clinical Director, 2011), and to have only four students start the school year was less than when the school first opened in February 2007 with 15 students (Clinical Director, 2011). On a positive note, the study had 100% participation from the four families enrolled to start the year August 20. Participation from the second site was four of five families with students enrolling the first week of September for an 80% participation rate, but again the fact that enrollment was so low at the second site (for new students arriving to start the school year in September) was also unanticipated.

These enrollment challenges led to the closing of the first site and the

restructuring of the second site causing data collection to have to be modified to include self-reports. Not using self-reports was a significant strength of this study as noted in Chapter 3; other researchers doing similar studies have stated that accepting parent self-reports can be a weakness (Kirschenbaum et al., 2011). However, self-reports were an unavoidable byproduct of the final data collection meeting being cancelled at the first site and not being fully attended at the second site; the clinical director who would have followed up with the parents who did not attend at the second site final meeting was dismissed as part of the second site restructuring. Her dismissal led to the necessity of this researcher following up with the parents who did not attend the final meeting at the second site (with the permission of the president of the organization) and the follow-up with the parents from the first research site where the final data collection meeting was cancelled.

Due to these unexpected changes at both study sites, the researcher contacted all four families at the first site directly and two of the four families at the second site directly to get final data for the study. The study design called for this researcher to meet with the parents at the beginning, middle, and end of the study to answer questions about the study and provide support and encouragement in following the program, but in order to reduce bias, this researcher was not going to be the one collecting the data; facility staff would be collecting data. This researcher was present at the first site at the beginning and the middle of the study but not at the end due to the unexpected closure of the facility with very limited notice and previous commitments this researcher had on the final day the facility was open (November 20, 2012). This researcher was not present at the second site at any point in the study due to the prohibitive cost of travel to the second site for this researcher. (The first site is approximately 30 miles from this researcher's

home, while the second site is approximately 2,500 miles from this researcher's home.) At the second site – the western facility – the clinical staff did all of the data collection except for the two families who did not attend the closure meeting; this researcher collected that data by phone after receiving permission from the organization's president to do so. At the original site – the southeastern facility – the clinical director did the weight and height measurements at the beginning, middle, and end of the study but this researcher did survey distribution, collection, and coding with each family for all three data collection dates, one weight and height measurement with orientation, survey administration at the facility for one parent in September, and final data collection for all four families.

Family members from each of the four families participating at the first site were present on site at or near the beginning of the study, but only two mothers attended the workshop in the middle of the study (October 13, 2012), and only one mother was able to be at the facility for a final weigh in and data collection at the time the facility closed. All four mothers at the first site expressed appreciation for accessibility to this researcher to answer their questions and provide support and encouragement to them given this researcher's knowledge of the program as the former clinical director of the southeastern school. They invited this researcher to have full accessibility to them by phone or e-mail if this researcher had questions or needed information to complete the study; they were very encouraging to this researcher and supportive of the completion of this study.

Chapter 5: Discussion

Chapter 5 contains the discussion of the results outlined in Chapter 4 with interpretations of the results in relationship to the original study design including the five research questions, the literature review, and the conceptual framework. The chapter opens with a summary of the study then proceeds to an interpretive discussion of the results for each research question in relation to previous research (as explained in the literature review and the conceptual framework found in Chapter 2) and the contribution to current and future research. Generalizability, implications for practice, and recommendations for future research will be the final sections prior to the concluding statement.

Summary of the Study

Problem statement. Parents play a critical role in their children's achievement and maintenance of a healthy weight through their role modeling and structuring of the home environment, but they seem unsure or unaware of the importance of their role.

Purpose statement. The goal of this study was to measure these two areas of parent impact: role modeling (making changes in their own habits and behavior) and structuring the home environment (making changes in the food available, level of support, and family functioning).

Research questions. (1) What is the relationship between parent weight loss and weight loss of a child enrolled in a long-term weight loss immersion program? (2) What is the relationship between parent self-monitoring and weight loss of a child enrolled in a long-term weight loss immersion program? (3) What is the relationship between self-reports of food available in the home and weight loss of a child enrolled in a long-term weight loss immersion program? (4) What is the relationship between perceptions of

family support and weight loss of a child enrolled in a long-term weight loss immersion program? (5) What is the relationship of perceived family functioning and weight loss of a child enrolled in a long-term weight loss immersion program?

Methodology. This study focused on student weight loss in relationship to parent participation. This quantitative correlational study using a pretest/posttest design with an intervention attempted to measure parent participation over a 10- to 16-week period. The pretest was done when the parent and child arrived at the program; the posttest was done at the conclusion of the study from mid-November through December 8 depending on the data collection limitations. In October at the midway point when the parents attended the mini-immersion parent workshop, each of the measures taken in the pretest and posttest was taken again to strengthen statistical power. The pretest and posttest consisted of both parent and child independently completing (1) the weigh in, (2) height measurement to calculate BMI, (3) the food checklist (see Appendix A), (4) the social support survey (see Appendix B), and (5) family survey (GF) (see Appendix C). Parent self-monitoring was measured at the mini-immersion parent workshop in October and in the final weekend of the study in November and through remote data collections in December.

Summary of findings by research question. Results for Research Question 1 demonstrate no correlation between parent weight loss and student weight loss but do illustrate the importance of a large sample size and the need for clearer communication when soliciting volunteers for this type of study in that the participants must understand that the expectation is to see how their participation (i.e., following the program), impacts their child's success – not their lack of participation (that is a different study). Results for Research Question 2 are consistent with previous research conducted by Kirschenbaum et al. (2011), which demonstrated that parents, even supportive parents, tend not to self-

monitor despite research that indicates it is a critical factor in student success. Results for Research Question 3 reveal that progress was made over time according to both student and parent perceptions of food available in the home; availability in the home of regular/full fat foods decreased and availability in the home low/nonfat foods increased. Results for Research Question 4 show that both parents and students, but especially students, perceive parent support as positive which may have a relationship to the students' success in the program; parents participating in this study may be perceived as more supportive because they have made the personal and financial commitment to enroll their son or daughter in a long-term weight loss immersion program. Finally, results of Research Question 5 demonstrate that seven of the eight families in this sample agreed that family functioning was healthy, and this may contribute to the success of the students in the program.

Discussion

The value of this study is not based on whether or not a correlation was found between student success and parent participation but in the information this study can provide to future researchers seeking to study children and their families who are engaging in long-term immersion treatment for obesity. The goal of this study, as discussed in Chapter 1, was to add to the professional body of knowledge on how to reduce the epidemic of childhood obesity. This study provides a framework for future studies that may be able to access a larger sample size at a facility that is more stable, and it also offers insight on how to design the study to be as flexible as possible given the potential need for adjustments, especially when studying a population over which a researcher has no control.

Relating results to literature review and conceptual framework. To better

understand the impact of each of these five questions on future research, it would be beneficial to look at each of them individually in relation to previous research and the conceptual framework for this study as discussed in Chapter 2. First, it is important to note that the theoretical foundation for these questions comes from social learning theory which postulates that modeling has a significant impact in a social environment (Newman & Newman, 1995). The literature review indicates that parents play a critical role in children achieving a healthy weight and that two areas of change are significantly important in impacting the epidemic of obesity: (1) parental role modeling of healthy behaviors and (2) facilitation of a healthy home environment (Birch & Anzman, 2010; Bogle & Sykes, 2011; Dalton & Kitzman, 2012; Dehghan et al., 2005; Heinberg et al., 2010; Hendrie et al., 2012; Hinkle et al., 2011; Li & Hooker, 2010; Newman & Newman, 1995; Puder & Munsch, 2010; Spruijt-Metz, 2011; Thompson, 2010). The research questions addressed these two areas of change. Research Questions 1 and 2 addressed individual changes parents can make in their behaviors that would be considered role modeling of desired behaviors. Research Questions 3, 4, and 5 focused on changes parents can make in the home environment.

The first research question asked about the relationship between parent weight loss and student weight loss: “What is the relationship between parent weight loss and weight loss of a child enrolled in a long-term weight loss immersion program?” The literature indicates that parental obesity is a significant indicator of obesity in children, and children with two obese parents are at a very high risk of severe obesity in adolescence (Svensson et al., 2011). There is also significant literature regarding parental lack of understanding about obesity (Boon & Clydesdale, 2005; Hughes et al., 2005), lack of motivation to change (Barlow et al., 2002; McFarlane et al., 2009), and

sometimes even indifference (Hughes et al., 2005) regarding their own obesity or that of their children. Although this study did not find a correlation between parent weight loss and student weight loss because of the small sample size, there is some significant information to be gained by looking at the stories of the individual parents participating.

The father who gained 9.2 pounds while participating in the study helps to highlight parental lack of understanding about obesity, parental lack of motivation to change, and even parental indifference noted in the literature (Barlow et al., 2002; Boon & Clydesdale, 2005; Hughes et al., 2005; McFarlane et al., 2009). This parent enrolled his child in a program that requires a substantial commitment of financial and personal resources, and instead of embracing the program and understanding the importance of his participation, he chose not to do the program and gained almost 10 pounds during the 12 weeks of his involvement in the study. This leads one to ask how this could have happened. The answer may lie in the conceptual framework for this study.

In this case, it appears that the father was experiencing one of the following three stages from Prochaska et al.'s (1994) stages of change noted in Chapter 2 under "conceptual framework": (1) Pre-contemplation – Resisting Change; (2) Contemplation – Change on the Horizon; and (3) Preparation - Getting Ready. When he attended the closure meeting on November 17, 2012, at the second research site, he had his final weigh in that revealed the 9.2 pound weight gain. Perhaps seeing this weight gain may have had an impact on his motivation to change; until someone actually sees their weight on the scale, they tend to minimize their weight gain (Kirschenbaum et al., 2005, 2007). He decided to utilize the opportunity of the closure meeting to gain understanding of the program – an opportunity which was available to him throughout the 12 weeks of his involvement in the study that he had chosen not to utilize. He decided to ask questions

about the program and hear very clearly the importance of his role in his son's weight loss during the closure meeting with Dr. Kirschenbaum (E. Tilson, personal communication, November 21, 2012).

This father came to the realization that the program was worthwhile after seeing his son's success (son lost 46.2 lbs. and dropped his BMI by 7.5 points, while his father gained 9.2 pounds and increased his BMI by 1.5 over the 12 weeks of their participation in the study). He made the decision that he needed to do something about his weight for his own sake and for the sake of his son which is the first step in the eight guidelines outlined in the 3-1-8 program used by the facility (Kirschenbaum, 2005, p. 8), and he began participating in the program after the study was over. He entered Prochaska et al.'s (1994) fourth stage of change, "Action – Time to Move," and worked through the stages of change created by Kirschenbaum outlined in Chapter 2 under "conceptual framework": "honeymoon," "frustration," and "acceptance" to come to a place of belief in the program and his ability to work the program successfully. As of early February 2013, he had lost approximately 30 pounds and was noticeably thinner according to Dr. Kirschenbaum who spoke with him at a parent meeting in early February at the second research site. This father has come to a point of understanding his role in his son's weight loss and has committed himself to achieving a healthy weight for his own benefit and the benefit of his son (D. Kirschenbaum, personal communication, February 26, 2013).

Other parents shared some of their personal challenges with this researcher regarding weight loss and supporting their child in achieving a healthy weight. One mother talked about her own struggles with obesity and feelings of low self-worth. She did not want her daughter to suffer the way she had and hoped that her daughter was not

experiencing the same challenges with self-worth. She reported that participating in the study had renewed her commitment to her own weight loss and she demonstrated significant progress – achieving the highest weight loss of any of the parent participants. She noted that self-monitoring, in particular, had helped her get back on track in her weight loss process. Another mother agreed that self-monitoring had a significant impact, stating that even though she was in a healthy weight range, whenever she self-monitored, she lost weight. Despite these endorsements by parents in the study and the research that states that self-monitoring is the “most powerful proven aid” in the weight loss process (Borushek, 2010, p. 15), self-monitoring was only done by four parents and of these only two did it most days of the week for most of the weeks of the study.

This leads to the second research question: “What is the relationship between parent self-monitoring and weight loss of a child enrolled in a long-term weight loss immersion program?” The literature notes that self-monitoring is a significant tool in successful weight control strategies (Borushek, 2010; Hendrie et al., 2012; Kirschenbaum et al., 2005, 2011). For this study, it offers a tangible way to demonstrate parent behavioral change. Self-monitoring in this study and Kirschenbaum et al.’s (2011) study consisted of writing three foods with their fat and calorie content using the fat and calorie guide parents were given; in addition, parents were encouraged to write steps taken every day using the pedometer they were given and commenting on their thoughts and impressions as they participated in the program, but these were optional. As long as they wrote three foods with fat and calorie content per day, they were considered successfully self-monitoring.

Unfortunately, as with previous research efforts (Kirschenbaum et al., 2011), most of the parents in this study did not demonstrate an understanding of the importance of

self-monitoring as evidenced by less than half the parents – four mothers – participating in self-monitoring and three fathers and three mothers choosing not to self-monitor at all (there were eight families involved and two of these had both parents commit to participate in the study, meaning 10 parents participated). Of the four mothers who did self-monitor, only two self-monitored most of the week and for most of the study. This lack of participation in self-monitoring occurred even in light of the information provided to parents in the initial introduction to the program, the books provided to them, and the mini-immersion workshop that they experienced which all clearly teach that self-monitoring is an exceptional tool for maintaining awareness and staying true to the program and is generally a significant indicator as to whether or not individuals will be successful in maintaining weight loss once they leave the program (Kirschenbaum, 2010).

It is important to point out that one parent developed a greater understanding of the importance of self-monitoring over the course of the program. She developed a renewed commitment to lose weight as a result of the intervention in the study and began self-monitoring on the last day of October 2012, continued through the end of the study, and continued consistently after the study was over. She reported that when she made a commitment to losing weight, self-monitoring helped her to maintain her awareness of what she was eating – fat, calories, and portions sizes – and stay focused on her weight loss program. This parent did not self-monitor during the first 10 weeks of the study but in the final 6 weeks began to build momentum, self-monitored once a week in weeks 11 and 12, twice in week 13, and three times in week 14; in the last 2 weeks of the study she self-monitored 6 of 7 days and 5 of 7 days, making a strong finish and continuing to self-monitor and lose weight long after the study ended. She also lost the most weight of any

parent during the study – 18.1 pounds.

The other mothers who self-monitored shared with this researcher that they found self-monitoring to be challenging but worthwhile if it helped their children to self-monitor. Two of these mothers were at a healthy weight and self-monitored to support their child in their weight loss program by modeling healthy behaviors. One even commented that when she self-monitored she lost weight. A mother who was not at a healthy weight participating at the second facility maintained a self-monitoring journal with almost 100% self-monitoring throughout the 13 weeks she participated in the study; she lost 10.4 pounds – second to the mother noted in the previous paragraph who participated in the study for 16 weeks and lost 18.1 pounds. The mother who lost the third highest amount of weight (10.1 pounds) did not self-monitor but also had much more time to lose weight – 7 more weeks – due to the delay in getting permission to contact this parent directly; her final weight self-report was recorded by this researcher on January 7, 2013.

The first two research questions were about individual behaviors that parents could change – participating in the program to lose weight and self-monitoring to stay focused on the program/maintain personal awareness and set an example for their children – while the last three questions address change in the home environment: (3) food available, (4) parental support, and (5) parents' facilitation of healthy family functioning. Research Question 3 shows that parents and students saw improvement in food available in the home over the course of the study, with full fat foods decreasing and low/nonfat foods increasing over the study. The intervention in this study was the combination of parent education/mini-immersion experience, educational materials supplied to parents, support from behavioral coaches, and interaction with their children

who are losing weight – children who are talking about the program and what they eat at the facility to successfully lose weight: nonfat foods. This may indicate that parents respond to education on how to improve the home environment when combined with seeing the positive weight loss in their children. Food checklists have been mentioned in the literature as effective tools to promote awareness in the same way that self-monitoring promotes self-awareness and supports adherence to weight loss programs and obesity prevention efforts (Hendrie et al., 2012).

Results of the social support surveys used for Research Question 4 – what is the relationship between perceptions of family support and weight loss of a child enrolled in a long-term weight loss immersion program – show that both parents and students, but especially students, perceive parent support as positive. Students as a whole rated their parents as encouraging and to a lesser extent acknowledged their willingness to facilitate exercise. Positive family support is noted in the literature as a critical part of weight loss success (Birch & Anzman, 2010; Bogle & Sykes, 2011; Dalton & Kitzman, 2012; Dehghan et al., 2005; Heinberg et al., 2010; Hendrie et al., 2012; Hinkle et al., 2011; Li & Hooker, 2010; Newman & Newman, 1995; Puder & Munsch, 2010; Spruijt-Metz, 2011; Thompson, 2010).

Results for Research Question 5 – what is the relationship of perceived family functioning and weight loss of a child enrolled in a long-term weight loss immersion program – demonstrate that seven of the eight families in this sample agreed family functioning was healthy. The research notes that improving family functioning is a recognized component of weight loss and obesity prevention due to the findings that low family functioning scores have been connected to higher BMI in children, and some studies indicate that family functioning may provide information for developing effective

interventions in reducing childhood obesity (Wen et al., 2011). In this study, family functioning was positive in 87.5% of the families, but the sample size of only eight families requires further research to determine the connection between family functioning and student success in a long-term weight loss immersion program.

Limitations and generalizability. Most of the limitations discussed in this section were previously noted in the “Limitations and delimitations” section beginning in Chapter 3 of this dissertation. This study had a number of weaknesses that limited its generalizability. First, the sample size was very small. Only eight families or a total of 19 people (10 parents, eight students and one sibling) participated; however, a small sample size was anticipated and the value of this study is in its contribution to future research as a pilot study of parent participation in a long-term weight loss immersion program; it introduces the strategy of weighing parents at the facility rather than relying on self-reports and having two therapists independently evaluate parent self-monitoring journals rather than relying on parent self-reports; subsequently even with limited participants, it offers other researchers a starting point to learn from the experience of this study and replicate this approach in a setting that allows for a larger sample.

Measuring parents’ weights and evaluating their self-monitoring at the facility also created challenges for some parents who did not have the means to travel to the boarding schools for all three required weekends when these measurements/evaluations were completed. To address this challenge, parents were given the opportunity to be weighed by their doctor or a fitness facility professional who could verify their weight. They could also mail their self-monitoring journals for evaluation at the facility and e-mail, fax, or mail their surveys to the facility. This flexible plan provided reliable data without parents having to come to the facility. However, there were still some self-

reports of weight loss by parents due to difficulties in collecting final data as discussed previously.

The unrepresentative demographic in this study further reduced the generalizability of the data as evidenced by the fact that the parents who volunteered to participate in this study were primarily female, Caucasian, in their mid-30s to early 50s, and of a higher socioeconomic status. There was also one African American family of four and one student from Cambodia who was adopted by a single mom who is Caucasian in her early 50s and at a higher socioeconomic level. There were three fathers and one male sibling who volunteered for the study; each of them completed the pretest, but only one of the fathers followed through and completed the midpoint evaluation and posttest. It is also important to note that the parents who volunteered for this study were parents who tended to be more educated and resourceful in that as a whole they were aware of the need for intervention to address their child's weight issues, they found the facility, and they made the financial and personal commitment to send their children to a long-term immersion program. As Creswell (2012) stated, they are "brighter, more receptive to treatment, or more familiar with a treatment" (p. 304).

There are also several threats to internal validity involved in this study. The dependent variable in this study is the weight loss of children aged 11-18 enrolled in a long-term immersion treatment program; and their weight loss could be significantly impacted by events that occur between pretest and posttest, i.e., "historical factors" (Creswell, 2012) other than the independent variables being measured in this study (parent weight loss, parent self-monitoring, food available in the home, family support, and family functioning). Parents who participated in the study but were not in the controlled environment of the boarding school were also affected by events between

pretest and posttest that impacted their weight loss that occurred outside the study. These events are outside the control of the researchers and make accurately inferring relationships between the dependent and independent variables challenging (Creswell, 2012).

Finally, this study was conducted by the former clinical director at the first facility with a strong bias in seeing the study outcome demonstrate that there is a relationship between parent participation and student success based on this researcher's 27 years of experience working with children and families and based on this researcher's experience during her 4 years as the clinical director at the first facility (2007- 2011). Dr. Daniel Kirschenbaum, one of the most prominent researchers in the field of weight loss immersion treatment, is also closely involved in this study as a mentor and dissertation committee member and teaches that parent role-modeling and facilitation of a healthy, weight-loss friendly home environment is essential to student success; his involvement in the study also adds bias. However, the expertise he provided in consulting with this researcher and the replication of aspects of his previous research are also strengths of this study and of great potential benefit to future researchers – despite the probable bias.

Implications for Practice

The epidemic of childhood obesity continues to grow, and the obesogenic environment continues to be a major challenge in developing effective interventions to address the childhood obesity epidemic; but parents may be in a position to have a significant impact by modeling and promoting healthy behaviors, changing the environment at home, and advocating for changes in the environment at school and in the community. This study demonstrated that when parents are made aware of the need for change for the benefit of their children, they will make modifications in their own

behavior and in the environment in their home. If parents chose to embrace these changes in their own behavior and their own home, there is potential for them to extend these changes into other areas where they have influence – schools, businesses, and the larger community – to have a significant impact on slowing the growth of the epidemic of childhood obesity.

It is particularly encouraging to see the example of the father who volunteered for the study who chose not to do the program during the study when he had no understanding of the importance of his role in his son's weight loss who later embraced his role and lost approximately 30 pounds (and continues to strive to achieve a healthy weight). At the closure meeting on November 17, he was able to see his weight gain, hear about the importance of his role, and receive answers to his questions about how to make a difference for himself and his son; when he was provided with the information at a time when he was ready to hear it, he took action. During the course of the study, this father moved through Prochaska et al.'s (1994) initial three phases of change from "pre-contemplation" when he resisted change with his choice to not follow the program to "contemplation" as he saw the changes in his son and began to consider the possibility of the need for change in himself, which led to the "preparation" stage when he began getting ready to change until he was finally able to move forward to the "action" stage and begin doing the program. Taking the stages of change into consideration when designing any practice intervention is advisable based on these study results and would be an important component of the screening process in future studies.

At this same meeting, the mother of another student who was struggling with how to set limits with her son and how to support him in the program went from a mindset of "it's his program; it's up to him" to an understanding of his need for her support. She

shared that she gained an understanding of the need to encourage her son through her own behavior and facilitate the program by modifying the home environment. She was empowered at the final meeting to say “no” and set reasonable limits and understand that this was her right and her responsibility as the parent. Her example illustrates that some of the fight against obesity is in helping parents to be parents – to understand their role in general and then empower them with specific tools to facilitate weight loss (Barlow et al., 2002). If a parent is struggling with how to set limits in general, they will struggle with how to set limits in facilitating a weight loss program for their child. Over the last 27 years of counseling children and families, this researcher has seen a consistent pattern of parents needing education and support in understanding their role as parents and being empowered to fulfill their role as parents, especially in the particularly challenging areas of teaching their children the skills of frustration tolerance, competence, and personal responsibility – all of which require limit setting, structure, and children hearing and dealing with the word “no.”

An important implication for practice is to take into consideration that underlying the parents’ lack of understanding of their role in their child’s weight loss may be a lack of understanding their role as parents. Many parents, such as the parent noted above, look at their adolescent child as requiring less support due to the adolescent’s desire for more independence. Parents can fall into the “it’s his program; it’s up to him” mentality. The fact is that in many ways adolescents require more support provided in different ways than when they were younger. The results of this study suggest that parent education to fight the epidemic of obesity would be most beneficial if it started with parents being provided with basic parenting skills. With this foundation, they could then be empowered to use education provided on specific tools to facilitate their child’s

achievement of a healthy weight.

Recommendations for Future Research

Considerations for future study planning. There are three areas of consideration using this particular design of pretest/posttest with an intervention. First, pretests and posttests that involve self-reports are a potential weakness to a study due to the limits of their reliability (Kirschenbaum et al., 2011); consequently, this study design called for parents to be weighed in at the facility. However, as it became clear that many parents may not be able to be at the facility for weigh in, this researcher provided the option that parents could be weighed at their doctor's office or their local fitness center where a nurse or fitness professional could write their weight on the doctor's or fitness facility stationary with their signature to verify the participant's weight. One father used the option of the fitness center and one mother used the option of the doctor's office which helped improve the reliability of the information but also allowed for more flexibility for parents.

A second consideration in creating future study designs is that when the researcher is not collecting data directly from participants, the researcher bias can be reduced and the participants can remain anonymous; however, given some of the time constraints of professionals at a facility, it would be beneficial to design a study with the option of the researcher collecting data if facility staff overlook or forget to collect certain data or if unexpected circumstances (such as the closure of the facility) cause a researcher to have to collect data directly because there is no other option to complete the study. Using facility staff to collect data has the benefit of reducing bias but also has the drawback of staff not being as invested in the study as the researcher and sometimes not fully completing data collection or underutilizing opportunities to gain valuable

information that would have been beneficial to the researcher.

Finally, having a back-up plan in case the number of participants is significantly less than expected would be advantageous as a means of preparing for the unexpected. The sample size in this study was expected to be small (10 to 20 families), but it was even smaller than anticipated due to circumstances outside the control of this researcher or anyone at the facilities. However, because the “back-up plan” of being a pilot study was in place, this study still has value as a means to share information from the first attempt at studying parent participation and student success at a long-term weight loss immersion program. The information contained in this study can be used by future researchers. If this had not been a pilot study but a study with many previous efforts, or if it had had even fewer participants, it might have been advisable to shift to a case study approach given the limited number of participants.

For closer examination. The number of participants was low by study standards but high relative to the participants available at the sites, especially when the restricted number of long-term immersion facilities is taken into consideration. As of this writing, there are a very limited number of long-term immersion treatment programs for adolescents available to study in the world: the facility in a western state that was the second site for this study, a new facility that opened in 2011 in a southeastern state, and several in Germany (D. Kirschenbaum, personal communication, June 15, 2012). Given these limitations, it is significant to have the opportunity to study a long-term weight loss immersion program for adolescents. There are many short-term programs lasting from 10 days to 8 weeks, typically summer camp setting, which have been in operation for approximately the last 40 years, but even with these facilities being more abundant, there is still little information in the research about them; despite 40 years of operation and

multiple facilities around the United States, only 22 articles were available in English on weight loss immersion programs (Kelly & Kirschenbaum, 2010).

Parents who participated in this study had some awareness of the obesity epidemic but many still had a missing sense of urgency; this missing sense of urgency was noted in Chapter 2 under “need for further research.” There is a lack of awareness of the obesity epidemic and a lack of a sense of urgency to do something about it. This study suggests that when parents are educated and see the results in their children’s weight loss, they do respond by changing their behavior and this bears further research. It would be helpful to determine if more awareness would impact having a sense of urgency and/or investment in dealing with the epidemic of obesity.

Concluding Statement

Although this study did not demonstrate a correlation between parent participation and student success due to the small sample size, it did confirm the value of exploring the impact of parent behavior on student success, especially in regard to how parents can modify their behavior (weight loss and self-monitoring) and how parents can modify the home environment (food available in the home, parental support at home, and facilitation of healthy family functioning) to empower their children to achieve a healthy weight.

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Appendix A
Food Checklist

Food Checklist

ID: _____

Date Completed: _____

Food Checklist

Please indicate whether you *currently* stock each item below in your home by making a check-mark in front of the item.

Regular/Full Fat Foods

- ☐ Regular Full Fat Mayonnaise
☐ Regular Full Fat Peanut Butter
☐ Olive Oil or other Cooking Oils
☐ Full Fat Salad Dressings
☐ Full Fat Milk
☐ 2% Milk
☐ Regular Full Fat Yogurt
☐ Regular Full Fat Cheese
☐ Eggs
☐ Regular Full Fat Ice Cream
☐ Reduced Fat Ice Cream (not fat free)
☐ Butter
☐ Margarine
☐ Regular/Full Fat Cookies
☐ Regular/Full Fat Twinkies, cupcakes, or muffins
☐ Regular/Full fat potato chips (Dorritos, Cheetos, etc.)
☐ Regular Soda
☐ Fruit Juice (Regular Sugar, including orange juice)

Low Fat/Nonfat Foods

- ☐ Fat-Free Mayonnaise
☐ Peanut Wonder – Peanut Butter Substitute
☐ At least 2 types of Mustard
☐ At Least Two types of Fat-Free Salad Dressings
☐ Fat-Free Cooking Sauces (as least one type, like FF Chicken Broth or FF Veggie Broth)
☐ Splenda or Equal (Aspartame)
☐ Nonfat No-Calorie Cooking Spray
☐ Salsa
☐ Fat-Free (Skim) Milk
☐ Fat-Free Yogurt (not frozen) – at least one type
☐ Fat Free Cheeses (at least two types, e.g., cream cheese; cheddar)
☐ Egg Beaters or Egg Whites
☐ Fat-Free Frozen Yogurt or Ice Cream
☐ Butter-Spray (Nonfat)
☐ Low Fat Popcorn (Orville Smart Pop or other 94% fat free)
☐ Fat Free Pretzels
☐ One type of Fat Free Brownie Mix
☐ Rice Cakes – at least one type, fat free
☐ One type (at least) fat free or very low fat chip
☐ Very Low Fat or FF Soups (at least one)
☐ FF or Very Low-Fat, High Fiber Cereals (at least one)
☐ Diet Soda
☐ Crystal light or diet Snapple

_____ Total number of foods
Indicated

_____ Total number of foods
indicated

Appendix B

Social Support Survey (Parent Version)

SOCIAL SUPPORT SURVEY (PARENT VERSION)

Please rate each question *twice*. Under *family*, rate the way you (and your family) relate to your child. Under *friends*, rate the way that you expect your child's friends will relate to your child. Please write *one* number from the following rating scale in each space, as shown in the SAMPLE below:

SAMPLE: I will not make fun of the low fat foods that my child will eat. But, I believe some of my child's friends will make fun of my child's new eating habits. So, I would answer like this:

	<u>Family</u>	<u>Friends</u>
A. Make fun of the foods my child eats.	A. <u>1</u>	A. <u>4</u>

none	rarely	a few times	often	very often
1	2	3	4	5

I (and members of my household) or my child's friends:

	<u>Family</u>	<u>Friends</u>
1. Encourage my child not to eat "unhealthy foods" (cake, salted chips) when he or she is tempted to do so.	1. _____	1. _____
2. Discuss my child's eating habit changes with my child (ask how he or she is doing with the eating changes).	2. _____	2. _____
3. Remind my child not to eat high fat foods.	3. _____	3. _____
4. Compliment my child on changing his or her eating habits. ("Keep it up", "I am proud of you")	4. _____	4. _____
5. Comment if my child goes back to his or her old eating habits.	5. _____	5. _____
6. Eat high fat foods in front of my child.	6. _____	6. _____
7. Refuse to eat the same foods my child eats.	7. _____	7. _____
8. Bring home foods my child is trying not to eat.	8. _____	8. _____
9. Get angry when my child encourages (me) to eat low fat foods.	9. _____	9. _____
10. Offer my child food he or she is trying not to eat.	10. _____	10. _____
11. Exercise with my child.	11. _____	11. _____

SOCIAL SUPPORT SURVEY (PARENT VERSION) CONTINUED

- | | | |
|--|-----------|-----------|
| 12. Offer to exercise with my child. | 12. _____ | 12. _____ |
| 13. Give my child helpful reminders to exercise.
("Are you going to exercise tonight?") | 13. _____ | 13. _____ |
| 14. Give my child encouragement to stick
with an exercise program. | 14. _____ | 14. _____ |
| 15. Change (my) schedule so we can exercise
together. | 15. _____ | 15. _____ |
| 16. Discuss exercise with my child. | 16. _____ | 16. _____ |
| 17. Plan for exercise on recreational outings. | 17. _____ | 17. _____ |
| 18. Help plan activities around my child's exercise. | 18. _____ | 18. _____ |
| 19. Ask my child for ideas on how I can get more
exercise. | 19. _____ | 19. _____ |
| 20. Talk to my child about how much they like
to exercise. | 20. _____ | 20. _____ |

Subtotals (Eating): _____

Subtotals (Exercise): _____

TOTAL SCORE: _____

Appendix C

Social Support Survey (Student Version)

SOCIAL SUPPORT SURVEY (STUDENT VERSION)

Please rate each question *twice*. Under *family*, rate the way your family relates to you. Under *friends*, rate the way that your friends will relate to you. Please write *one* number from the following rating scale in each space, as shown in the SAMPLE below:

SAMPLE: No one in my family makes fun of the low fat foods that I eat. But, some of my friends make fun of my new eating habits. So, I would answer like this:

	<u>Family</u>				<u>Friends</u>
A. Make fun of the foods I eat.	A. <u>1</u>				A. <u>4</u>
	none	rarely	a few times	often	very often
	1	2	3	4	5

My family (or members of my household) or friends:

	<u>Family</u>	<u>Friends</u>
1. Encourage me not to eat "unhealthy foods" (cake, salted chips) when I'm tempted to do so.	1. _____	1. _____
2. Discuss my eating habit changes with me (ask me how I'm doing with my eating changes).	2. _____	2. _____
3. Remind me not to eat high fat foods.	3. _____	3. _____
4. Compliment me on changing my eating habits. ("Keep it up" & "I am proud of you")	4. _____	4. _____
5. Comment if I go back to my old eating habits.	5. _____	5. _____
6. Eat high fat foods in front of me.	6. _____	6. _____
7. Refuse to eat the same foods I eat.	7. _____	7. _____
8. Bring home foods I'm trying not to eat.	8. _____	8. _____
9. Get angry when I encourage them to eat low fat foods.	9. _____	9. _____

- | | | |
|--|-----------|-----------|
| 10. Offer me food I'm trying not to eat. | 10. _____ | 10. _____ |
| 11. Exercise with me. | 11. _____ | 11. _____ |
| 12. Offer to exercise with me. | 12. _____ | 12. _____ |
| 13. Give me helpful reminders to exercise.
("are you going to exercise tonight?") | 13. _____ | 13. _____ |
| 14. Give me encouragement to stick with
my exercise program. | 14. _____ | 14. _____ |
| 15. Change their schedule so we could
exercise together. | 15. _____ | 15. _____ |
| 16. Discuss exercise with me. | 16. _____ | 16. _____ |
| 17. Plan for exercise on recreational outings. | 17. _____ | 17. _____ |
| 18. Help plan activities around my exercise. | 18. _____ | 18. _____ |
| 19. Ask me for ideas on how <i>they</i> can
get more exercise. | 19. _____ | 19. _____ |
| 20. Talk about how much they like to exercise. | 20. _____ | 20. _____ |

Subtotals (Eating): _____

Subtotals (Exercise): _____

TOTAL SCORE: _____

Appendix D
Family Survey

FAMILY SURVEY

Below are 12 statements about family relationships. Please read each statement carefully and place a check below one of the options provided to indicate your opinion about your family's relationships (strongly agree, agree, disagree, strongly disagree). Please indicate only one response for each item and respond to every statement, even if you are not sure of your choice.

	<i>Strongly Agree</i>	<i>Agree</i>	<i>Disagree</i>	<i>Strongly Disagree</i>
1. Planning family activities is difficult because we misunderstand each other.	_____	_____	_____	_____
2. In times of crisis we can turn to each other for support.	_____	_____	_____	_____
3. We cannot talk to each other when we feel sad.	_____	_____	_____	_____
4. Individuals in the family are accepted for who they are.	_____	_____	_____	_____
5. We avoid discussing our fears and concerns.	_____	_____	_____	_____
6. We express feelings to each other.	_____	_____	_____	_____
7. There are lots of bad feelings in our family.	_____	_____	_____	_____
8. We feel accepted for who we are.	_____	_____	_____	_____
9. Making decisions is a problem in our family.	_____	_____	_____	_____
10. We are able to make decisions about how to solve problems.	_____	_____	_____	_____
11. We don't get along well together.	_____	_____	_____	_____
12. We confide in each other.	_____	_____	_____	_____

Appendix E
Self-Monitoring Evaluation Tool

Parents Participation Study August – December 2012