STRATEGIES TO PROMOTE WEIGHT LOSS IN ADOLESCENTS WITH INTELLECTUAL AND DEVELOPMENTAL DISABILITIES

By

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ABSTRACT

Introduction: Adolescents with intellectual and developmental disabilities (IDD) are at an increased risk of obesity with up to 55% considered overweight and 31% obese. However, there has been minimal research on weight management strategies for adolescents with IDD. This series of studies aimed to (1) compare the effectiveness of two weight loss diets, an enhanced stop light diet (eSLD) and a conventional diet (CD), for overweight and obese adolescents with IDD, (2) to determine the feasibility of using tablet computers as a weight loss tool in overweight and obese adolescents with IDD, (3) to determine if the use of photo-assisted 3-day food records significantly improved the estimation of energy and macronutrient intake reported in proxy assisted 3-day food records in adolescents with IDD, and (4) to evaluate the intervention components of the program by discovering parents' feelings and opinions on the intervention program for both diet groups. **Methods:** A 2-month pilot intervention was conducted. All participants were randomized to the eSLD or CD, and were given a tablet computer which they used to track daily dietary intake and physical activity. Participants and a parent met weekly with a health educator via video chat on the tablet computer to receive diet and physical activity feedback and education. Participants completed a proxy-assisted 3-day food record and took pictures of all meals at baseline and the end of month 2 to determine dietary intake, and parents of participants were interviewed using a semi-structured interview at the end of the study. **Results:** Twenty participants (45% female, 14.9 ± 2.2 yrs. old) were randomized and completed the intervention (10 eSLD, 10 CD). Participants in both diets were able to lose weight, the mean weight change in the eSLD group is 1.67kg more than that of the CD group, but the difference (eSLD: -3.89 ± 2.66 kg vs. CD: -2.22 ± 1.37 kg)was not statistically significant.

Furthermore, participants in both groups increased their diet quality as measured by the HEI-2005. Participants were able to use the tablet computer to track their dietary intake 90.4% (range: 27.8%-100%) of possible days, to track their physical activity 64.3% (range: 0%-100%) of possible days, and to attend 80.0% of the video chat meetings. The use of photo-assisted food records significantly increased the estimates of energy intake by 16.7% (p=0.0006) at baseline and 10.6% (p=0.0305) at the end of month 2 compared to use of proxy-assisted food records. Interviews identified that parents had a positive attitude towards the program, liked the convenience of the program, appreciated the use of the tablet computer, and felt that the program taught beneficial strategies to continue to encourage healthy habits in the home. **Conclusion**: A weight loss program in adolescents with IDD was successfully conducted, with overall acceptability from both adolescents and parents. Both the eSLD and the CD were identified as weight management strategies that could potentially lead to clinically significant weight loss in adolescents with IDD, and tablet computers were found to be a feasible tool and delivery system for weight loss in adolescents with IDD. The results also suggest that photo-assisted 3-day food records may provide better estimates of energy intake in adolescents with IDD compared to proxy-assisted 3-day food records. Finally, parents reported changing their behaviors to help their child successfully follow a weight loss intervention, but may need more education about the benefits of physical activity and ideas on how to increase the physical activity of adolescents with IDD.

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CHAPTER ONE:

INTRODUCTION

DEFINITION OF IDD

In the United States approximately 1-3% of the population is diagnosed with an intellectual or developmental disability (IDD)[1]. IDD is defined by the American Association of Intellectual and Developmental Disabilities (AAIDD) as a disability originating before the age of 10, characterized by significant limitations in both intellectual function and in adaptive behavior[2].

Intellectual functioning refers to general mental capacity, such as learning, reasoning, and problem solving. This is typically measured as an Intelligence Quotient (IQ), with an IQ below 70 being indicative of intellectual limitations [2].

Adaptive behaviors are comprised of three skills: conceptual skills, social skills, and practical skills. Conceptual skills refer to language and literacy, ability to comprehend time, manage money and other number concepts, and give self-direction. Social skills refer to interpersonal skills, social responsibility, self-esteem, social problem solving, and the ability to follow rules and to obey laws. Practical skills refer to activities of daily living, occupation skills, travel skills, use of the telephone, use of money, and ability to follow a schedule or routine[2].

IDD is diagnosed when an individual has an IQ below 70 and has limitations in two or more adaptive behaviors (listed above) [3]. Furthermore, IDD can be classified into mild, moderate, and severe forms based on an individual's IQ. An IQ of 50-69 indicates mild IDD, 35-49 indicates moderate IDD, 20-34 indicates severe IDD, and below 20 indicates profound IDD[4].

There are a myriad of underlying causes of IDD that include genetic conditions, growth or nutrition deficiencies during pregnancy, prematurity, and autism [1]. However,

genetic conditions appear to be the primary cause of IDD, contributing to 40-60% of severe cases[5]. Such conditions include Down syndrome (trisomy 21), DiGeorge syndrome, and fragile X syndrome[5].

OBESITY RATES AND HEALTH COMPLICATIONS

The prevalence of obesity in both adults and adolescents with intellectual and developmental disabilities (IDD) is approximately 2-3 times greater than in the general population[6-15]. In terms of adolescents, Rimmer et al. [15] reports that 42% of adolescents with autism are overweight with 25% considered obese, and 55% with Down syndrome are overweight with 31% considered obese. This rate of obesity is a serious problem; studies show that obese adolescents are up to 4 times more likely to become obese adults and to develop chronic diseases, such as hypertension, type 2 diabetes, and metabolic syndrome compared to their non- obese peers[16-19].

DIET AND PHYSICAL ACTIVITY

Poor nutritional intake is believed to contribute to the increased risk of obesity; however, nutritional intake and diet quality have only been examined in adults. Draheim et al. [20] reports that 71.4 - 85.6% of community dwelling adults with IDD consumed a high-fat diet (>30% of calories from dietary fat), and less than 7% consumed the recommended five servings of fruits and vegetables per day (0% - 4.4% of men and 0 - 6.4% of women)[21]. Adolfsson and colleagues [20] show adults with IDD have low intakes of fiber, vitamin A, thiamin, riboflavin, folic acid, iron, and selenium. Ptomey et al.[22] examined data from

overweight and adults with IDD who participated in a weight loss research study. Participants consumed diets low in fruits, whole grains, and healthy oils, meeting 25.2%, 23.0%, and 1.1% of the federal dietary guidelines, respectively. These individuals also consumed a diet high in sodium with 87.3% consuming more than the recommended intake of sodium (0.7 grams per 1,000 kcals). Additionally, participants had a lower Healthy Eating Index (HEI) score than the general population (45.6 vs. 58.2, respectively)[22].

Furthermore, adults with IDD are less active and have lower levels of cardiovascular fitness than the general public, which may contribute to the increased obesity risk and related health consequences in these individuals[23-26]. The activity level of adolescents with IDD appears to be similar to adults with IDD. Lin et al. [26] reports that only 29.9% of adolescents with IDD have regular physical activity habits and only 8% met the U.S. Surgeon General's and American College of Sports Medicine's recommendation of at least 30 minutes of moderate-intensity physical activity most days of the week. The most common physical activities among this population are walking, Special Olympics, and jogging.

PAST RESEARCH

Healthy People 2020, the National Institute on Disability and Rehabilitation Research, The Academy of Dietetics and Nutrition, the World Health Organization, and the Surgeon General's Report on Health and Wellness of People with Disabilities all recommend additional efforts to decrease the high prevalence of obesity amongst children, adolescents, and adults with IDD [3,27-29]. However, little research has been conducted to

promote weight loss or the prevention of weight gain in adults or adolescents with IDD [30-39].

In 2008, Hamilton et al. [40] conducted a systematic review and found 8 studies evaluating weight loss interventions for adults with IDD. This review identified no adequately powered, long-term studies that targeted changes in both energy intake and energy expenditure. The most recent interventions reported within the review included a behavioral approach focusing on teaching self-control techniques, such as reducing the rate of eating and increasing awareness of environmental cues related to eating[39], a physical activity only intervention that required all participants to walk for a set number of minutes each day [38], and a health promotion intervention for adults with IDD living in hospitals or long-term facilities[33]. The mean weight change elicited by these interventions was minimal (+0.7 kg to –3.4 kg). The follow-up weight at 6 and 12 months following active intervention was also minimal (range -2 to +3 kg). Thus, both weight loss and weight maintenance were ~1.5 to 3% from baseline, which is considerably less than the long-term weight loss necessary to achieve health benefits (5-10%) as recommended by the NHLBI Guidelines [41].

In 2011, Saunders et al.[37] reported the results of a pilot study in 79 adults with mild to moderate IDD (age = 31.6 ± 9.6 yrs., BMI = 37.0 ± 9.6). All participants were placed on an enhanced Stop Light Diet (eSLD) that provided 1200 to 1300 kcals/day. The eSLD was a modified version of the original Stop Light Diet (see Potential weight management approaches for adolescents with IDD section) that incorporated pre-packaged meals (2 shakes and 2 prepackaged entrees/d), 5 servings of fruits and vegetables per day, and a physical activity component. The average weight loss for the 73 participants who completed the 6-month intervention was 6.1 kg (6.3%). Subsequently, 50 of 73 participants

elected to continue treatment and were supported until the study ended one year after baseline. In that group, average weight loss from baseline to 12 months was 8.6 kg (9.1%). A six month follow-up phase was conducted, and 29 of the 43 individuals who participated in the follow-up continued to lose weight, while 14 regained some weight, the highest being a gain of 5.8 kg. Of those 14 that regained weight, only 4 regained as much as they had originally lost. Overall, the average weight loss of the 43 participants in the follow-up group was 8.8 kg, with weight change ranging from +5.8 kg to -23.2 kg.

Only one published study exploring weight loss and maintenance in adolescents with IDD was identified. Hickson et al.[42] reported findings from a non-controlled, single group study of 17 youth with IDD, 14±4 years of age. The intervention consisted of a 10-week school-based program with 16 physical activity and nutrition lessons. There was a trend for reduction in BMI at 10 weeks; however, at follow-up (6 months), BMI exceeded baseline.

POTENTIAL WEIGHT MANAGEMENT APPROACHES FOR ADOLESCENTS WITH IDD

The conventional reduced energy diet (CD), a 500-1000 kcal/day deficit achieved through meal planning, is recommended by the Academy of Nutrition and Dietetics (AND) [43] and the NHLBI Guidelines [41], and results in weight loss of approximately 1 to 2 pounds per week. The CD includes reducing portion size, consuming a low-fat diet (less than 30% calories from fat), and increasing fruit and vegetable intake. Consuming high volume/low calorie foods, such as fruits and vegetables, has been shown to be beneficial to weight loss

because they can help to reduce over-consumption of high-energy dense foods, possibly resulting in weight loss [44-47].

However, implementation of the CD can be difficult for the general population, and it may be particularly problematic for individuals with IDD. The CD can require calorie counting, following a group format, and an ability to read and to comprehend educational materials, nutrition labels, etc. Given their limited cognitive function and need for individualized education, these requirements may present an insurmountable barrier for adolescents with IDD.

The successful pilot study by Saunders et al.[37] introduced a simplified approach to energy restriction for adults with IDD using the Stop Light Diet in combination with portion controlled meals and increased fruit and vegetable consumption. The original Stop Light Diet was developed by Epstein [48] for use in children and categorizes foods according to energy content: red (high energy), yellow (moderate energy), and green (low energy) to correspond to a traffic signal. Children were instructed they could eat as many green foods as they wished, to limit the yellow foods, and to avoid the red foods. The original Stop Light Diet was given a Grade 1 (strong, consistent supporting evidence) for its effectiveness in weight management for children by The Academy of Nutrition and Dietetics Evidence Analysis Library [49].

Portion controlled meals (PCMs) designed for weight loss are any prepackaged, pre-portioned food product that is low-calorie, high-nutritional content, and intended to take the place of regular meals or snacks. Examples of PCMs include shakes, such as Slim Fast®, or frozen or shelf-stable entrees, such as Lean Cuisine®. PCMs are effective for weight loss as they are decision-free so there is no guesswork or measuring of portion size.

Furthermore, PCMs are convenient, and there are a sufficient variety of product options to satisfy even picky eaters. In normal adults, reduced-energy diets utilizing PCMs have been consistently shown to result in significantly greater weight loss when compared to a conventional meal plan diet [50-53]. The Academy for Nutrition and Dietetics Evidence Analysis Library has also given PCMs a Grade 1 rating for their effectiveness in weight management [54]. Although PCMs have not been used in adolescents with IDD, a recent report [55] has shown significantly improved weight loss over 4 months using PCMs meals compared with a CD in 113 obese, typically developing adolescents.

TABLET COMPUTERS

Due to their limited cognitive function, there are some barriers to conducting weight management research in individuals with intellectual and developmental disabilities. One of these barriers is their ability to accurately remember their dietary intake and physical activity and to be able to conduct dietary recalls. It is for this reason that there are no validated methods of dietary assessment in this population[56,57]. The use of tablet computers may help adolescents track their dietary intake and physical activity, and the use of photo-assisted food recalls may help to improve the accuracy of the 24-hour diet recall in individuals with IDD.

The use of technology has become a common occurrence in adolescents in the general population. A report by The U.S. Department of Education [58] indicated that over 90% of teens (ages 13-17) use computers and that 25% of 5-year-olds can use the Internet. Perhaps surprising to those not familiar with adolescents with IDD, the use of technology is widespread in this population as well. The high use of computer technology appears to

affect all adolescents including those with IDD. Previous studies indicate computer technology has been successfully used for education and training of both children and adults with IDD [59-64]. Research has demonstrated that adolescents with mild to severe IDD can independently operate a tablet computer to watch movies, listen to music, and play games[65]. A recent systematic review of 15 studies using tablet computers as a teaching tool for individuals with IDD found that the use of iPads in this population has positive effects and concludes that they are a viable teaching tool for individuals with IDD[66]. Computer and iPad technology has been used to teach adolescents with IDD to use the spellcheck function of a word processor [66], to identify and write numbers [67], to understand emotional expression and social skills[68,69], to acquire and prepare food [70], and to perform daily life skills by providing auditory and visual prompts[66].

A photo-assisted food recall is a technique in which digital images are taken of all food and beverages consumed during the recall period. This method has been validated for assessing portion sizes [71] in subjects eating prepared [72,73] or home meals [74] and for assessing food intake in confined settings [75] for both children and adults. Previous studies have been conducted in adults with IDD to determine the feasibility of using photo-assisted dietary assessments. These studies have found that digital photography appears to be a feasible, reliable, and valid method for assessing dietary quality in individuals with IDD, and results in more food items being identified [76,77]. The use of photo-assisted 24-hour food recall in adults with IDD resulted in a significantly greater energy intake being reported per eating occasion than the standard recalls[78]. However, there are no published reports of studies that examined the benefit or feasibility of using digital photography to enhance dietary assessments in adolescents with IDD.

CONCLUSION

IDD is a disability characterized by significant limitations in both intellectual function and in adaptive behavior that currently affects 1-3% of the population. Obesity rates in adolescents with IDD are 2-3 times greater than in their non-disabled peers. It has been suggested that poor diet quality and lack of physical activity may contribute to these increased rates. The high prevalence of obesity in adolescents with IDD is alarming; however, minimal research has been conducted to promote weight loss or prevent weight gain in this population. Studies have found that traditional weight loss methods may not be appropriate for individuals with IDD due to their decreased cognitive ability. One pilot study found that the use of an innovative diet, an eSLD, may successfully promote weight loss and weight maintenance in adults with IDD, but this diet has not yet been implemented in adolescents. The use of tablet computers may decrease the research limitations found when working with individuals with IDD by allowing them to easily track their dietary intake and physical activity, and provide more accurate dietary assessments. However, the feasibility of using tablet computers to promote weight loss in adolescents and to conduct dietary assessments in adolescents with IDD has not been studied.

PURPOSE OF DISSERTATION

Research to identify successful weight loss and weight management strategies in adolescents with IDD is needed. The goals of this project were to (1) compare the effectiveness of two weight loss diets, an enhanced stop light diet (eSLD) and a conventional diet (CD) in overweight and obese adolescents with IDD, (2) determine the feasibility of using tablet computers as a weight loss tool in overweight and obese

adolescents with IDD, (3) determine if the use of photo-assisted 3-day food records significantly improved amount of energy and macronutrient intake reported in proxy assisted 3-day food records in adolescents with IDD, and (4) to evaluate the intervention components of the program by discovering parent's feelings and opinions on the intervention program for both diet.

CHAPTER TWO:

AN INNOVATIVE WEIGHT LOSS PROGRAM FOR ADOLESCENTS WITH INTELLECTUAL AND DEVELOPMENTAL DISABILITIES

ABSTRACT

INTRODUCTION: Adolescents with intellectual and developmental disabilities (IDD) are at an increased risk of obesity with up to 55% considered overweight and 31% obese. However, there has been minimal research on weight management strategies for adolescents with IDD. The purpose of this study was to compare the effectiveness of two weight loss diets, an enhanced Stop Light Diet (eSLD) and a conventional diet (CD), and to determine the feasibility of using tablet computers as a weight loss tool in overweight and obese adolescents (11-18 yrs.) with IDD. **METHODS:** A 2-month pilot intervention was conducted. All participants were randomized to the eSLD or CD, and were given a tablet computer, which they used to track daily dietary intake and physical activity. Participants and parents met weekly with a health educator via video chat on the tablet computer to receive diet and physical activity feedback and education. **RESULTS:** 20 participants (45% female, 14.9 ± 2.2 yrs. old) were randomized and completed the intervention (10 eSLD, 10 CD). Participants in both diets were able to lose weight, and there were no significant differences between the eSLD and CD (-3.89 ± 2.66 kg vs. -2.22 ± 1.37 kg). Participants were able to use the tablet computer to track their dietary intake 90.4% (range: 27.8%-100%) of possible days, to track their physical activity 64.3% (range: 0%-100%) of possible days, and to attend 80.0% of the video chat meetings. **CONCLUSIONS**: Both dietary interventions appear to promote weight loss in adolescents with IDD, and the use of tablet computers appears to be a feasible tool to deliver a weight loss intervention in adolescents with IDD.

INTRODUCTION

Child and adolescent obesity rates in the U.S. have more than tripled in the last 30 years. Approximately 31% of adolescents are overweight or obese (BMI ≥ 85th percentile), with 19% considered obese (BMI ≥ 95th percentile)[79]. The prevalence of obesity in adolescents with intellectual and developmental disabilities (IDD) is approximately 2 times greater than in the general population [6-15,80,81]. Rimmer et al. [15] reports that 42% of adolescents with autism are overweight or obese, with 25% of those considered obese, and 55% of adolescents with Down syndrome are overweight, with 31% of considered obese. This rate of obesity is a serious problem as studies show that obese adolescents are up to 4 times more likely to become obese adults and to develop chronic diseases, such as hypertension, type 2 diabetes, and metabolic syndrome than their healthy weight peers [16-19].

Healthy People 2020, The National Institute on Disability and Rehabilitation Research, The Academy of Nutrition and Dietetics, The World Health Organization, and the Surgeon General's Report on Health and Wellness of People with Disabilities all recommend additional efforts to decrease the high prevalence of obesity among children, adolescents, and adults with IDD [3,27-29]. However, there is limited data on which to base effective weight management interventions in any age group with IDD[30-39].

A conventional reduced energy diet (CD), with an energy deficit of 500-1000 kcal/day, is recommended for healthy individuals by the Academy of Nutrition and Dietetics[43] and the National Heart, Lung and Blood Institute (NHLBI) Guidelines [41], and results in weight loss of approximately 1 to 2 pounds (lbs)/week. However, implementation of the CD can be difficult for the general population and may be

particularly problematic for individuals with IDD as it can require calorie counting and an ability to read and comprehend educational materials and nutrition labels. Given their limited cognitive function and need for individualized instruction, these requirements may prevent adolescents with IDD from successfully following a CD.

While the CD may not be the best strategy for adolescents with IDD, few weight loss techniques have been found to be successful in individuals with limited cognitive functioning. Hamilton et al. [40] conducted a systematic review and found eight studies evaluating weight loss interventions for adults with IDD; none were identified for adolescents. Interventions reported within the review included a behavioral approach focusing on teaching self-control techniques, such as reducing the rate of eating and increasing awareness of environmental events related to eating [39], a physical activity only intervention that required all participants to walk for a set number of minutes each day [38], and a health promotion intervention for adults with IDD living in hospitals or long-term care facilities [33]. The mean weight change elicited by these interventions was minimal, +0.7 kg to –3.4 kg, (~1.5% to 3%), which is considerably less than the long-term weight loss necessary to achieve health benefits (5-10%) as recommended by the NHLBI Guidelines [41] or the minimum 3% weight loss suggested as clinically relevant [82].

To date, there has only been one successful weight loss study in individuals with IDD. A pilot study by Saunders et al. [37] introduced a simplified approach to energy restriction for adults with IDD using an enhanced Stop Light Diet (eSLD). This diet provided 1200 to 1300 kcals/day and included a modified version of the original Stop Light Diet in combination with pre-packed meals (2 shakes and 2 prepackaged entrées), five servings of fruits and vegetables a day, and a physical activity component. In this study, 79 adults with

mild to moderate IDD (age = 31.6 ± 9.6 yrs., BMI = 37.0 ± 9.6) were placed on the eSLD. The average weight loss for the 73 participants who completed the 6-month intervention was 6.1 kg (6.3%). Subsequently, 50 of 73 participants elected to continue treatment, and the average weight loss after 12 months was 8.6 kg (9.1%).

A limitation of the study by Saunders et al. was that participants were only seen monthly due to cost and time restrictions, caused by using an individual face-to-face delivery system to provide monthly dietary education. As participants were only seen monthly, they did not get immediate feedback on their dietary choices or physical activity. This may be problematic as individuals with IDD may not be able to remember what they ate, how much physical activity they completed, or any events or behaviors that affected diet and physical activity outcomes during that month; thus, they may not get the proper dietary or physical activity education they need. While the eSLD appears to be a successful weight loss diet in adults with IDD, the use has not been reported in adolescents with IDD, and it is unknown if the eSLD promotes significant weight loss in that population.

Adolescents in the general population frequently use computer technology. A report by The U.S. Department of Education [58] indicated that over 90% of teens (ages 13-17) use computers and that 25% of 5-year-olds can use the Internet. Perhaps surprising to those not familiar with adolescents with IDD, the use of technology is widespread in this population as well. Previous studies indicate computer technology has been successfully used for education and training of both children and adults with IDD [59-64] [66]. Technology in the form of tablet computers may be an effective educational tool in weight management of adolescents with IDD. Technology-based interventions have shown great promise as a mechanism for promoting weight loss in the general population, as they are a cost-effective,

scalable platform. The most effective interventions have interactive tools, tailored feedback to participants, and some form of health instructor contact [83]. The use of tablet computers and technology in adolescents with IDD could allow for instant feedback, serve as a visual aid, and allow for more education and health educator feedback, which may reduce some of the limitations in conducting a weight loss program in individuals with IDD. However, there are currently no published reports that have explored the feasibility of using tablet computers as a weight loss tool in adolescents with IDD.

The purpose of this study was to compare the effectiveness of two weight loss diets, an enhanced Stop Light Diet (eSLD) and a conventional diet (CD), and to determine the feasibility of using tablet computers as a weight loss tool in overweight and obese adolescents with IDD.

METHODS

Participants and Enrollment

An 8-week pilot investigation for adolescents with mild to moderate IDD was conducted. To participate, individuals had to be 11-18 years of age with mild to moderate IDD as verified by a parent or legal guardian, of sufficient cognitive ability to understand directions, and able to communicate preferences (e.g. foods), wants (e.g. more to eat/drink), and needs (e.g. assistance with food preparations) through spoken language. Participants needed to be overweight or obese (BMI > 85th percentile on CDC growth charts) or have greater than a 0.5 ratio of height to waist circumference as this indicates excess central adiposity in children and adolescents [84-87]. All participants were required to live at home with a parent or guardian and to have access to wireless internet. Individuals

were excluded from the study if they had insulin dependent diabetes, had participated in a weight reduction program involving diet and physical activity in the past 6 months, were currently being treated for major depression or eating disorders, were consuming special diets (vegetarian, Atkins, etc.), had a diagnosis of Prader-Willi Syndrome, were pregnant, planning on or becoming pregnant within the next two months, or if they became pregnant during the study. Participants were recruited through local community programs, advertisements in the target area, and through special education programs in local school districts. All parents or legal guardians signed a university approved consent form (appendix A), and all participants gave oral assent (appendix A) to participant in the study. Once enrolled, all participants were randomized to either the enhanced Stop Light Diet (eSLD) or the conventional diet (CD).

Intervention Components

Overview. All participants were randomized to either the eSLD or CD, and participants were given a tablet computer (Apple iPad2®) that they used to track dietary intake and daily steps. At baseline, the participant and a parent attended a 90-minute at-home diet orientation session, and subsequently participated in weekly at-home 30-minute education sessions that were conducted over video chat (FaceTime) on the iPad. All participants completed outcome assessment at baseline and at the end of month 2.

Theoretical model. The intervention is based on the behavioral principles of Social Cognitive Theory (SCT) [88], a frequently used framework for weight management in both children and adults [89]. The intervention utilized goal setting, self-monitoring, stimulus control (prompts, scheduling, environmental cues), modeling, positive reinforcement,

behavioral contracting and self-regulatory techniques. Family based weight loss interventions using behavioral principles to modify both diet and PA have been shown to promote weight loss in typically developing adolescents [90-92] . Parental involvement improves dietary control both at home and when eating out, can influence planning and scheduling of PA, and provides frequent opportunities for supportive interactions with the participant [93]. One parent served as the primary family contact and agreed to partner with health educators in conveying the principles of the intervention (diet/physical activity) to the participant, as well as assisting their dependent with adherence to the study protocol.

eSLD diet. The original stop light diet (SLD) developed by Epstein [48] for use in children, categorizes foods according to energy content: red (high energy), yellow (moderate energy), and green (low energy) to correspond to a traffic stop light (appendix E). Children are encouraged to eat as many green foods as desired, to limit consumption of yellow foods, and to avoid red foods. The SLD is easy for children and individuals with IDD to understand, especially with added assistance from parents [37,48], and was given a Grade 1 (strong, consistent supporting evidence) for its effectiveness in weight management for children by The Academy of Nutrition and Dietetics Evidence Analysis Library [49].

The SLD was enhanced (eSLD) with the addition of fruits and vegetables (≥ 5 servings/day), and high-volume, low-energy portion controlled meals (PCMs) consisting of 2 entrées and 2 shakes a day. The eSLD provided 1200-1400 kcals/day corresponding to a 500-700 calorie deficit. Non-caloric beverages were allowed ad libitum. All PCMs were provided to participants and were delivered to the participants' homes on a monthly basis. An example of a typical eSLD meal plan appears in appendix E.

PCMs designed for weight loss are any pre-packaged, pre-portioned food product that is low-calorie, high in nutritional content, and intended to take the place of regular meals or snacks. PCMs are an effective weight loss tool as they are decision-free so there is no guesswork or measuring of portion size. Furthermore, PCMs are convenient, and there are a sufficient variety of product options to satisfy even picky eaters. In normal adults, reduced energy diets utilizing PCMs have been consistently shown to result in significantly greater weight loss when compared to a conventional meal plan diet [50-53]. The Academy of Nutrition and Dietetics Evidence Analysis Library has given PCMs a Grade 1 rating for their effectiveness in weight management [54]. Although PCMs has not been used in adolescents with IDD, a recent report [55] has shown significantly improved weight loss over 4 months using PCMs compared with a CD in 113 obese, typically developing adolescents.

CD diet. Participants in the CD group were educated to consume a nutritionally balanced, high-volume, lower fat (20-30% energy) diet as recommended by the United States Department of Agriculture's (USDA) MyPlate approach [94]. Participants' energy needs were estimated using the equation of Mifflin-St Jeor [95] times 1.3 to account for daily physical activity. A deficit of 500-700 kcal/day was prescribed; however, prescriptions never recommended less than 1200 kcals/day as this could inhibit weight loss and is not recommended for adolescent weight management [96]. Consumption of five servings of fruits and vegetables per day was recommended. Participants were provided examples of meal plans consisting of suggested servings of grains, proteins, fruits and vegetables, dairy, and fats based on their energy needs (appendix F), and participants were counseled on appropriate portion sizes using three-dimensional food models.

Physical activity. All participants were instructed to engage in moderate intensity physical activity to gradually accumulate a total of 60 minutes per day at least five days per week as recommended by the American College of Sports Medicine (ACSM)[97]. As adolescents with IDD have difficulty with estimating time spent doing physical activity, participants were asked to wear a pedometer and to log steps on the tablet computer daily so that the health educator could monitor their progress and provide weekly feedback.

Tablet Computer. A tablet computer (iPad2, Apple, Cupertino, CA, USA) was given to each participant for the duration of the study. The application "Lose It!" was used to track all foods and beverages consumed and physical activity minutes while the application "iStep Log" or "Fitbit" was used to track daily steps. Lose It! is an application that contains a food database with the nutrient content for many foods. This application allows an individual to easily track what they ate for all meals and snacks. Food and beverages were logged in Lose It! by entering in the food name then selecting the portion size or by scanning the bar code of the food item using the tablet computer. iStep Log is a simple application that allowed a participant to easily track their daily steps. When an individual logged into the application, he or she selected the day of the week and entered their steps as reported by their pedometer. Due to software malfunctions in the iStep Log application, the final 7 participants used a Fitbit wireless activity tracker to monitor their daily steps taken. Fitbit activity trackers accurately capture all activity, steps taken, stairs climbed, and intensity of activities and wirelessly syncs all data collected to the tablet computer. The corresponding Fitbit application on the iPad provided a graphic display of accumulated steps as participants move towards their step goal. All information entered into the applications was stored on a secure online server that was only accessible by the health

educators and study staff. Screen shots of the Lose it! and Fitbit applications can be found in appendix G.

Weekly monitoring. Participants met with a health educator for 30 minutes once a week over video chat using the application FaceTime on the tablet computer. During these meetings, the health educator logged onto the participant's Lose It! and iStep Log/Fitbit accounts to assess how well the participant followed the diet and physical activity intervention and provided feedback to the participant. A brief lifestyle modification session covering topics such as fruit and vegetable consumption, physical activity, or portion size was provided during each video chat session (appendix C).

Data Collection and Assessment

Health History Questionnaire. Each participant's health history, as well as basic demographic information was assessed using a health history questionnaire completed by a parent at the time of consent (appendix B). The same questionnaire also assessed the participant's diet and physical activity history such as typical diet, frequency of eating away from home, and exercise habits.

Anthropometrics. Weight was assessed with a calibrated digital scale accurate to ±0.1 kg (Model #PS6600, Befour, Saukville, WI). All participants were weighed with the participant clothed and without shoes. Weight was taken at baseline and the end of months 1 and 2. Height was measured at baseline and the end of month 2 using a portable stadiometer (Model #IP0955, Invicta Plastics Limited, Leicester, UK). BMI was calculated as weight (kg)/ height $(m)^2$. Waist circumference was obtained at baseline and the end of month 2 following the methods described by Lohman et al. [98]

Accelerometry. To assess physical activity levels, all participants wore an ActiGraph Model GT3+ (ActiGraph LLC, Pensacola, FL) for 4 consecutive days (2 week days and 2 weekend days) at baseline and at the end of month 2. Accelerometer data (activity counts) collected was summarized in 1-minute epochs using the proprietary ActiGraph software prior to exporting the data to Microsoft Excel. The accelerometer outcome variables were the average accelerometer counts/min over the 4-day period and time spent sedentary and in light, moderate, and vigorous intensity PA. To identify intensity levels, the cut-points used in the National Health and Nutrition Examination Survey as described by Troiano et al. [99] were used. For the purposes of our analyses, daily valid data time was defined as 1440 minutes minus [Non-wear time + Spurious data time + Malfunction time]. Daily wear time was equal to 1440 minus non-wear time. Non-wear time was defined by an interval of at least 20 consecutive minutes of activity counts of zero counts/min with an allowance for 1-2 minutes of counts between 0 and 100. Spurious data time was defined as activity counts ≥ 16,000 counts/min and malfunction time was defined as consecutive identical counts/min > zero (e.g., 32,767) for > 20 minutes. A valid monitoring day was defined as ≥ 10 hours of valid data.

Energy/macronutrient intake. Dietary intake was assessed using 3-day photo-assisted diet records at baseline and at the end of month 2, a technique that has been demonstrated to improve dietary assessment of individuals with IDD [76,78]. Participants (with the help of a parent) were asked to write down all food and beverages consumed over 3 days (2 weekdays, 1 weekend day) and to use the tablet computer to take pictures of all meals consumed at home during those days. A registered dietitian reviewed the food records with the participant and parent and collected additional details from the

photographs. All dietary records were entered by a registered dietitian into Nutrition Data System for Research (NDSR; version 2011). NDSR output files were generated to determine total energy intake, macronutrient composition, and diet quality.

Diet Quality. The Healthy Eating Index-2005 (HEI-2005) was used to calculate diet quality from data obtained from the 3-day photo-assisted diet records at baseline and at the end of month 2. The HEI-2005 [100] is a measure of diet quality developed by the United States Department of Agriculture that assesses conformance to the 2005 Dietary Guidelines for Americans [101]. The HEI-2005 assesses the intake of total fruit, whole fruit, total vegetables, dark green and orange vegetables, total grains, whole grains, milk, meat and beans, non-hydrogenated oils, saturated fat, sodium, and calories from solid fats, alcoholic beverages, and added sugars (SoFAAS) and provides a point value based on how well a person meets the dietary guidelines, expressed as a percent per 1000 kcals [100]. The HEI-2005 was calculated using NDSR output and followed the method developed by Miller et al [102]. Point values for each category were summed to give the final HEI score, with 100 points as the maximum score. Diet quality was considered "good" for total scores greater than 80, "needs improvement" for scores ranging between 51-80, and "poor" for scores less than 51 [100].

Tablet Usage. To determine the feasibility of using tablet computers to track dietary intake and daily steps, participants' Lose it! and iStep Log/ Fitbit usage was monitored. Lose It! and iStep Log/Fitbit data were reviewed by a registered dietitian to determine how many days out of the 2-month intervention participants were able to track at least one meal and enter their daily steps.

Tablet Questionnaire. At the end of months 1 and 2, the participant completed a questionnaire, with the help of their parent, assessing their comfort level using the tablet computer, tracking their food and steps, and using the video chat (appendix B). All questions had responses given in a 5-point Likert scale ranging from "very easy" to "very hard".

Semi-Structured Interview. At the end of month 2, a recorded semi-structured interview was conducted with the participant's main family caretaker to gather information on the overall ease and enjoyment of the program (appendix B). Interviews were transcribed verbatim, and thematic analysis was conducted (appendix I).

*Statistical Analysis***.** Sample demographics and all outcome measures were summarized using descriptive statistics. Wilcoxon rank sum test compared group median at baseline and the end of month 2 as well as changes in group means from baseline to month 2. General linear modeling was used to examine group, time, or group-by-time interaction effects on each outcome. Simple linear regression was used to examine if a covariate, such as participants' age, gender, race, and level of IDD severity (mild or moderate), was associated with weight loss. Statistical significance was determined at 0.05 alpha level, and all analyses were conducted using SAS (version 9.2, 2012, SAS Institute Inc.) [103].

RESULTS

Recruitment. Of the 21 participants who enrolled in the pilot study, 20 completed the study. The participant who did not complete the study dropped after baseline testing due to family complications. Of the 20 participants who completed the study (age = 14.9 ±

2.2 yrs., 45% female), 10 were randomized to the eSLD, and 10 were randomized to the CD. Table 1 provides demographic data for the participants who completed the study. The only significant difference between diet groups was age (p=0.04).

Table 1. Demographic data of all participants and participants by diet group

	All Participants (n=20)	Participants on CD (n=10)	Participants on eSLD (n=10)
Variable	*M* ± *SD* / %	*M* ± *SD* / %	*M* ± *SD* / %
***Age* (yrs)**	14.9 ± 2.2	13.9 ± 2.2	15.9 ± 1.8
Gender			
Male	11 (55%)	5 (50%)	6 (60%)
Female	9 (45%)	4 (40%)	5 (50%)
Race			
Asian	1 (5%)	1 (10%)	0 (0%)
Black	4 (20%)	0 (0%)	4 (40%)
White	14 (70%)	8 (80%)	6 (60%)
Mixed	1 (5%)	1 (10%)	0 (0%)
Ethnicity			
Not	20 (100%)	10 (100%)	10 (100%)
Level of IDD			
Mild	12 (60%)	8 (80%)	4 (40%)
Moderate	8 (40%)	2 (20%)	6 (60%)
Secondary			
Autism	9 (45%)	5 (50%)	4 (40%)
Down Syndrome	8 (40%)	3 (30%)	5 (50%)
Other	3 (15%)	2 (20%)	1 (10%)
BMI Percentile	90.6% ±8.1%	88.4% ±9.0%	92.7% ± 6.0%
Waist to Height	0.5 ±0.1	0.5 ±0.1	0.5 ±0.1

Anthropometrics. Participants in the eSLD had a mean weight loss of 3.89 ± 2.66 kg (p=0.002), compared to participants in the CD who had a mean loss of 2.22 ± 1.37 kg (p=0.002). This resulted in a loss of 4.6% and 3.3% body weight, respectively. There were no significant differences in weight change between groups. A Cohen's d measure of effect size test found the effect size of group difference is 0.8. Table 2 provides full weight loss results. Covariates that significantly affected the weight data were race (weight change in

kg p=0.015; BMI change p=0.036) and level of IDD severity (weight change in kg p=0.005, % weight change p=0.015, BMI change p=0.007). Waist circumference decreased in both the eSLD (p=0.011) and the CD (p=0.012), there we no significant differences between groups

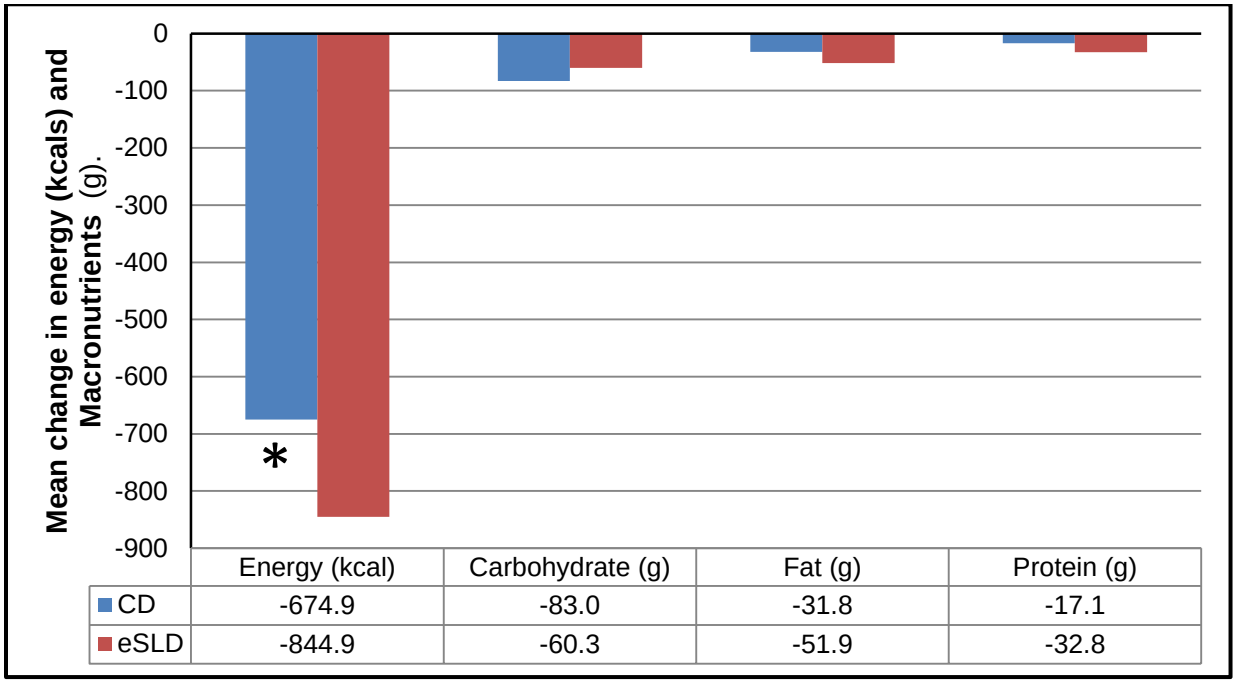
Table 2. Change in body weight (kg) and BMI across intervention of all participants and participants by diet group

	All Participants (n=20)	**CD (n=10)**	**eSLD (n=10)**	**p- value**
Weight (kg)				
Baseline	73.7 ± 28.3	65.1 ± 25.3	82.3 ± 29.8	0.093
2 months	70.6 ± 26.5	62.8 ± 24.1	78.4 ± 27.7	0.143
Weight change (kg)	-3.1 ± 2.2	-2.2 ± 1.4	-3.9 ±2.7	0.072
% Weight change	-4.0 ± 1.8	-3.3 ± 1.2	-4.6 ±2.1	0.123
BMI				
Baseline	28.8 ± 6.5	26.9 ± 5.3	30.7 ±7.3	0.248
2 months	27.5 ± 6.0	25.9 ± 5.1	29.2 ±6.7	0.280
BMI change	-1.3 ± 0.7	-1.0 ± 0.4	-1.6 ±0.9	0.105
Waist Circumference				
Baseline	85.2 ± 15.3	80.6 ± 12.6	89.8 ± 17.0	0.185
2 months	82.2 ± 13.8	77.4 ± 10.9	87.0 ± 15.3	0.125
Waist Circumference Change	-3.0 ± 3.0	-3.2 ± 3.3	-2.8 ± 2.9	0.807

Accelerometry. Valid accelerometer data were collected from 16 subjects (7 eSLD, 9 CD) at baseline and 15 subjects (9 eSLD, 6 CD) at the end of month 2. These data revealed there was a significant decrease in sedentary activity time in both groups (p=0.028); however, there was no difference between groups. No significant differences in moderate or vigorous activity were detected.

Energy/macronutrient intake. Three-day photo-assisted food records were collected from 20 participants (60 records at baseline and 60 at the end of month 2). Fifty-two

records were deemed to be reliable and representing a typical day at baseline, and 51 at the end of month 2. Dietary analysis revealed a significant 844.9 ± 641.0 kcal deficit between baseline and the end of month 2 in the eSLD(p=0.009) and 674.9 ± 769.4 kcal (p=0.027) deficit in the CD. Participants in the eSLD had a significantly greater reduction of energy intake compared to participants in the CD group (p=0.048). Figure 1 provides a macronutrient comparison of the CD vs. the eSLD. Of the 10 participants in the eSLD, 100% consumed the low calorie shakes, and 70% consumed the PCMs entrées that were provided. Participants in the eSLD consumed an average of 1.1 ± 0.1 shakes and 1.0 ± 0.1 entrées per day.



* Significantly greater reduction of energy intake in eSLD compared to CD (p=0.048).

Figure 1. Changes in energy and macronutrient intake across the intervention for eSLD and CD participants

Diet Quality. The HEI-2005 increased in both diet groups; however, this was not found to be significant. Participants in the eSLD increased from a mean score of 55.9 ± 9.0 to 62.6 ± 6.3. Participants in the CD improved from a mean score of 58.7 ± 8.3 to 61.5 ±5.6. There were no significant differences between groups. A significant improvement across the intervention in both groups was a decrease in calories from added sugars and fat (p=0.015). Table 3 provides full HEI-2005 results.

Table 3. Healthy Eating Index-2005 scores for adolescents with IDD across a 2-month intervention.

	Maximum Score Possible	**All Participants**	**CD**	**eSLD**	**Group Differences**
Component		*M*± SD	*M*± SD	*M*± SD	*p*
Total fruits					
Baseline	5	2.1 ± 1.4	2.2 ± 1.5	2.0 ± 1.4	0.751
2 months	5	2.5 ± 1.5	2.5 ± 1.5	2.5 ± 1.6	0.840
Change		0.4 ± 1.3	0.3 ± 1.1	0.5 ± 1.5	0.616
Whole fruits					
Baseline	5	2.6 ± 1.5	3.0 ± 1.6	2.1 ± 1.4	0.168
2 months	5	3.1 ± 1.6	3.4 ± 1.6	2.8 ±1.7	0.380
Change		0.6 ± 1.5	0.3 ± 1.2	0.7 ±1.9	0.644
Total vegetables					
Baseline	5	2.9 ± 1.4	2.6 ± 1.4	3.2 ±1.4	0.321
2 months	5	3.0 ± 1.2	2.8 ± 0.9	3.3 ±1.4	0.490
Change		0.2 ± 1.6	0.2 ± 1.0	0.2 ±2.0	0.839
Dark green & yellow vegetables					
Baseline	5	1.4 ± 1.7	1.4 ± 1.7	1.3 ±1.7	0.980
2 months	5	2.3 ± 1.8	1.4 ± 1.5	3.2 ±1.7	0.029*
Change		1.0 ± 2.5	0.1 ± 1.3	1.8 ±3.1	0.049*
Total grains					
Baseline	5	4.4 ± 0.7	4.5 ± 0.9	4.3 ±0.5	0.070
2 months	5	4.4 ± 0.7	4.5 ± 0.6	4.3 ±0.8	0.396
Change		-0.0 ±0.6	0.0 ±0.6	-0.0 ±0.7	0.719
Whole grains					
Baseline	5	1.5 ± 1.3	1.7 ± 1.6	1.2 ±0.7	0.512
2 months	5	1.8 ± 1.3	1.9 ± 1.5	1.7 ±1.2	0.986
Change		0.3 ± 1.7	0.2 ± 1.9	0.5 ±1.6	0.516

	Maximum Score Possible	All Participants	CD	eSLD	Group Differences
Milk					
Baseline	10	6.6 ± 2.8	7.0 ± 2.7	6.1 ±3.0	0.358
2 months	10	6.2 ± 2.7	6.5 ± 2.7	6.0 ±2.9	0.669
Change		-0.3 ± 3.6	-0.5 ± 2.2	-0.1 ±4.7	0.956
Meat & beans					
Baseline	10	7.5 ±2.4	6.2 ± 2.6	8.9 ±1.0	0.007*
2 months	10	8.0 ± 1.7	7.7 ± 1.7	8.2 ±1.7	0.538
Change		0.4 ± 1.9	1.5 ± 2.0	-0.7 ±1.0	0.009*
Oil					
Baseline	10	6.2 ±2.4	6.7 ± 3.4	5.7 ± 3.4	0.537
2 months	10	5.2 ±3.0	5.5 ± 2.9	5.0 ± 3.2	0.752
Change		-1.0 ±3.9	-1.3 ± 4.1	-0.8 ± 3.9	0.753
Saturated fat					
Baseline	10	5.9 ± 1.8	6.3 ± 2.0	5.4 ± 1.6	0.155
2 months	10	6.8 ± 1.2	6.6 ± 1.4	7.0 ± 0.9	0.781
Change		0.9 ± 2.0	0.2 ±1.9	1.6 ± 1.9	0.137
Sodium					
Baseline	10	1.8 ± 1.9	2.2 ± 2.4	1.5 ± 1.3	0.836
2 months	10	1.7 ± 1.0	2.0 ± 0.9	1.3 ± 1.1	0.180
Change		-0.2 ± 1.9	-0.2 ± 2.1	-0.2 ± 1.7	0.753
SoFAAS					
Baseline	20	14.6 ± 3.9	15.0 ± 4.5	14.2 ± 3.4	0.446
2 months	20	17.1 ± 2.0	16.8± 2.4	17.3 ± 1.5	0.988
Change		2.52 ± 4.2	1.9 ± 5.1	3.1 ± 3.2	0.447
Total score					
Baseline	100	57.3 ± 8.5	58.7 ± 8.3	55.9 ±9.0	0.971
2 months	100	62.0 ± 5.8	61.5 ± 5.6	62.6 ± 6.3	0.897
Change		4.71 ± 9.3	2.8 ± 7.3	6.6 ± 11.0	0.529

***** Indicates a significant difference between groups using Wilcoxon signed-rank test.

Tablet Usage. Participants in both groups entered their food intake into the tablet computer with a median of 90.40 % (range: 27.8%-100%) and entered their steps 64.3% (range: 0-100%) of total days in the study. Constant malfunctioning of the iStep Log application lead to lower rates of recording step counts. Thus, alternative solutions were explored, and a sample group of 7 participants were given a Fitbit wireless activity monitor. Participants using the Fitbit recorded their steps 72% of the time. Additionally,

participants attended an average of 80% of weekly video chat meetings, and 84% had either weekly FaceTime or phone contact with their health educator. There were no significant differences in tracking data between diet groups or level of IDD classification (mild vs. moderate).

Tablet Questionnaire. Eighty-five percent of the adolescents reported that they enjoyed using the tablet computer, and 95% reported that the tablet computer was either "easy" or "very easy" to use. Seventy percent of participants reported that it was "easy" to enter their food into the Lose It! application, and 10% reported that it was "very easy". Only 10% reported that it was "hard" to enter food into Lose It! Thirty-five percent reported that entering their steps into iStep Log or Fitbit application was "very easy", 35% reported it was "easy", 10% reported it as "ok", and 20% reported it as "hard". All participants who reported entering steps as "hard" were adolescents who experienced software malfunctions with the iStep Log application. All participants who used the Fitbit reported it was "very easy" to use.

Semi-Structured Interview. When asked about their involvement in helping to enter food into the Lose It! application, 42% of parents reported that the participants entered everything on their own, 26% reported that they helped the participants to enter the food, and 32% reported having to enter everything themselves.

DISCUSSION

The current study was a pilot investigation of an innovative diet for adolescents with IDD and the first known weight loss intervention in adolescents with IDD. The results found that adolescents with IDD are willing to follow a supervised diet program and can be

successful in reducing their weight. All of the participants lost weight during the diet phase, regardless of diet randomization. Although the program was short in duration, the results are encouraging as both diets exceeded the minimum 3% weight loss suggested as clinically relevant [82] while also producing improvements in overall diet quality.

The use of the eSLD resulted in a slightly greater calorie deficit and weight loss than the CD, and while the difference was not significant, the small sample size and short duration of the program may be responsible for the lack of significant difference between groups. Diet quality data revealed that, while not significant, participants in the eSLD had a greater increase of whole fruits, dark green and yellow vegetables, and whole grains and a greater decrease in saturated fat and calories from added fat and sugars compared to participants in the CD. These results suggest that the eSLD may result in a significantly greater weight loss and increase in diet quality with a greater sample size and longer duration when used in adolescents with IDD compared to a CD.

Adolescents with IDD can follow an eSLD, and participants appeared to enjoy the use of PCMs. While only 70% consumed the provided entrées, the other 30% still used PCMs. In these cases, the families just chose to purchase low-calorie frozen meals from the grocery store as the participant did not like the taste of the provided entrées. Parents reported liking the use of PCMs as this allowed the adolescent to have more control over food choices. The adolescent could choose their own meal and warm it up on their own. Furthermore, parents did not have to worry about determining if it was a healthy choice or an appropriate portion size.

Throughout the intervention, participants appeared to increase the amount of time spent doing physical activity. Although accelerometer data only showed a significant

decrease in sedentary time with no significant increases in moderate or vigorous activity, self-reported step data from the iStep Log and Fitbit applications showed that participants in both groups increased their daily step count by an average of 3000 steps across the 2-month intervention. Thus, adolescents with IDD may be willing to follow a physical activity program but may need a longer intervention period to significantly increase their physical activity. Alternatively, a greater sample size may be needed to show a significant increase in adolescents' time spent performing moderate or vigorous activity. The most common forms of physical activity reported were school-based sports and physical activity-based video games, such as the Wii® and XBox Kinect®.

This study also determined that it is feasible to use a tablet computer as a weight loss tracking tool and education delivery system in adolescents with IDD. Participants were able to track their food intake 83.4% of the time, which is a greater rate than in the general public [104-106]. While the ability to track steps appeared to be lower than the ability to track dietary intake, two major issues in this study were that some participants lost their pedometer within 3 days of starting the program and that the iStep Log application frequently crashed on many participants' tablet computers. Thus, Fitbit activity monitors were used for the final seven participants. Future studies should consider using electronic pedometers that will automatically import step data into the tablet computer and Lose It! application, such as the Fitbit used in the latter part of this study.

While this study is promising, limitations include a small sample size, a short duration, and non-stratified level of IDD severity during randomization. Given that the current study was a self-funded pilot, the final sample size was only 20; thus, the power of the study was very small (a priori power could not reach 0.6 even for a large effect). If the

sample size had been larger, the power of the study and ability to detect significant differences between groups would have increased. A post-hoc power analysis shows that 54 subjects (27 in each group) in total will provide 80% power for Wilcoxon rank sum test to detect such an effect at 0.05 level (G-power 3.1). Furthermore, the study was only 2 months in duration, whereas most weight loss program are 6 months in duration. However, it can be hypothesized that weight loss would have continued in both groups, and a possible difference between diets could have been detected (the predicted weight loss at month 6 is 5.0 - 6.7 kg (6.9 - 9.2% of baseline weight) for the eSLD and 2.9 - 3.8 kg (4.7 - 6.2% of baseline weight) for the CD assuming 50-100% of current rates of weight loss at the end of month 2). The lack of stratification by level of severity of IDD resulted with the eSLD having more moderate severity IDD participants while the CD had mostly mild severity IDD participants. Consequently, our results do not reflect the ability of an individual with moderate IDD to follow a conventional diet. One final limitation is that all participants used a tablet computer to help them follow the intervention; it could be suggested that the use of the tablet computer caused participants to be more successful in reducing their energy intake and losing weight, than using the diets alone. Therefore, it is unknown if the use of technology enhanced the effect of the diets.

Overall, this study is the first known weight loss intervention in adolescents with IDD. It was found that both the CD and the eSLD may be effective weight loss strategies in adolescents with IDD. Furthermore, adolescents with IDD can use tablet computers to track their dietary intake and daily steps and to communicate with a health educator over video chat, which suggests that tablet computers are a feasible weight loss tool and delivery system for adolescents with IDD. Long-term studies in a large sample of adolescents with

IDD are needed to determine if the eSLD is more effective, in terms of weight loss, than the CD and if the use of tablet computers in combination with the diets is more effective than diets alone.

CHAPTER THREE:

DIGITAL PHOTOGRAPHY PROVIDES BETTER ESTIMATES OF DIETARY INTAKE IN ADOLESCENTS WITH INTELLECTUAL AND DEVELOPMENTAL DISABILITIE

ABSTRACT

INTRODUCTION: Dietary assessment of adolescents with intellectual and developmental disabilities (IDD) is challenging due to the limited cognitive abilities of this population. The objective of this study was to determine if photo-assisted food records improve the assessment of energy and macronutrient intake in adolescents with IDD at two time periods. **METHODS**: Participants used a mobile device to take photos of all food and beverages consumed over a three-day period while also completing a proxy-assisted 3-day food record with the help of a parent. A registered dietitian reviewed the proxy-assisted 3-day food record with the participant and a parent and then reviewed the images with the participant and recorded the differences between the standard records and the photos. The standard records and the photo-assisted records were entered separately into Nutrition Data System for Research (NDSR) for dietary analysis. **RESULTS:** Two hundred and twelve eating occasions (130 at baseline, and 82 at the end of month 2) were entered from 20 participants (age = 14.9 ± 2.2 yrs., 45% female). Participants captured photos for 53.8 ± 31.7% of all eating occasions consumed at baseline and 47.2 ± 34.1% at the end of month 2. Photo-assisted records captured significantly higher estimates of energy intake per eating occasion than regular proxy-assisted records at baseline ($p=0.0006$) and the end of month 2 ($p=0.03$), as well as significantly greater grams of fat ($p=0.011$), carbohydrates ($p=0.0033$), and protein ($p=0.0041$) at baseline and significantly greater grams of carbohydrates ($p= p=0.0074$) at the end of month 2. **CONCLUSION:** The use of photo-assisted diet records appears to be a feasible method to obtain substantial additional details about dietary intake that consequently may improve the overall energy and

macronutrient intake reported when using proxy-assisted diet records in adolescents with IDD.

INTRODUCTION

Due to the complexity of nutrition and the many health risks that accompany poor diet quality and excessive energy intake, it is essential to have valid methods to assess dietary intake. Dietary assessments that provide valid and reliable data are vital to increase the effectiveness of health interventions and policies both at the individual and population level.

Adolescents with intellectual and developmental disabilities (IDD) are a population that may benefit from dietary monitoring as the prevalence of obesity in adolescents with IDD is approximately 2-3 times greater than in healthy adolescents [6-15,80,81]. The high prevalence of obesity is a serious problem as research shows that obese adolescents are up to 4 times more likely to become obese adults and to develop chronic diseases, such as hypertension, type 2 diabetes, and metabolic syndrome compared to their healthy weight peers [16-19].

While the need for accurate and valid dietary assessment is high for adolescents with IDD, there are inherent challenges in conducting dietary assessments in this population due to compromised cognitive functioning, poor memory, and a shortened attention span [57,107]. Consequently, researchers have not yet validated a method for dietary intake assessment in individuals with IDD due to these significant barriers in collecting valid and reliable data [57].

Dietary records are an assessment method in which respondents record all food and beverages consumed, with the corresponding amounts, over a period of days. Dietary records have the potential to provide accurate data for food consumed during the recording period. They allow respondents to record food and beverages as they are

consumed, lessening the problem of omission and increasing the described details of foods. For these reasons, diet records are often regarded as one of the best dietary assessment methods in the general population[108].

Proxy-assisted diet records are an assessment method in which a family member or staff member assists a participant in completing a diet record. Proxy-assisted records are commonly used in populations with limited reporting capabilities, such as young children and individuals with Alzheimer's [109], and have been used in adults with IDD [20,37,110]. While it appears proxy-assisted diet records may be a logical technique for dietary assessments in adolescents with IDD, proxy-assisted food records have not been validated in adults with IDD. Furthermore, no dietary assessment technique has been found to be valid or accurate in adults or adolescents with IDD [20,37,110].

A photo-assisted diet record is a new technique in which digital images are taken of all food and beverages consumed during the record period. This method has been validated in the general population for assessing portion sizes [71], as well as energy and macronutrient intake [72-75,111-114].

Previous studies have determined the feasibility of using photo-assisted dietary assessments in adults with IDD. These studies have found that digital photography appears to be a feasible and reliable method for assessing dietary intake in adults with IDD[76,77]. The use of photo-assisted 24-hour food recalls in adults with IDD resulted in a significantly greater energy intake being reported per eating occasion when compared to the standard recalls (p=0.002) as well as a greater intake of fat (0=0.006), protein (p=0.029), and carbohydrates (p=0.003)[78]. The authors concluded that photo-assisted recalls have the potential to be a more accurate dietary assessment technique than 24-hour recalls alone.

While previous studies in adults with IDD have determined photo-assisted recalls improve the total energy and macronutrients reported compared to a 24-hour recall, no information is available regarding the use of digital photography in dietary assessment in adolescents with IDD, and whether it would improve the estimated energy and macronutrient intake reported compared to a proxy-assisted 3-day food record. Therefore, the aim of this study was to determine if the use of photo-assisted 3-day food records significantly different intake estimates of energy and macronutrient intake reported in proxy-assisted 3-day food records in adolescents with IDD.

METHODS

A cross-sectional study was conducted with 20 adolescents with IDD. Each participant completed two separate photo-assisted 3-day food records, 2 months apart. All participants had mild (IQ of 50-69) to moderate (IQ of 35-49) IDD and were enrolled in a healthy lifestyle intervention trial. All parents or legal guardians signed a university approved consent form (appendix A), and all participants gave oral assent (appendix A) to participant in the study.

All participants were given a mobile device with a built-in camera at the beginning of the study that was subsequently used as part of the healthy lifestyle intervention. The mobile device was an Apple iPad 2 (Apple, Cupertino, CA, USA), Wi-Fi only model (241.2 x 185.7 x 8.8 mm; 601 g) with a 246-mm screen (diagonal dimension), 16 GB storage, and iOS5[115]. The iPad 2 uses an LED backlight screen with a 1024 x 768 screen resolution at 132 pixels per inch and has a battery life of up to 10 hours. The iPad 2 rear-facing camera (1280 x 720 pixels or 0.92 megapixel camera with autofocus) was used for the photo-

assisted records. At baseline, the participant and a parent were instructed on basic mobile device functions, including how to operate the camera application. The study personnel demonstrated how to operate the camera application and observed the participant independently take satisfactory images.

Participants were instructed to take before and after images with the mobile device of all food and beverages consumed at home for a 3-day period (2 weekdays, 1 weekend day) at baseline and the end of month 2. Each participant was given a fiduciary marker (a 5 cm X 5cm checked square) to be included in all images to serve as a reference measure to aid study staff in determining portion sizes. Participants also completed hard-copy proxy-assisted diet records, with the help of a parent, for the same 3 days. Calendar prompts were programmed into the mobile device to remind participants to comply with the photo/record protocol. Example images can be found in appendix H.

During a home visit at baseline and the end of month 2, a registered dietitian reviewed the 3-day diet record with the participant and parent without the use of the images. Portion guides (i.e., glasses, mugs, bowls, circles, thickness sticks, chip bags, drink bottles, a 12-inch ruler, measuring cups and spoons, a grid, wedges, geometric shapes, and diagrams of chicken pieces)[116] were used to help clarify portion size and provide better accuracy. After the initial review was completed, the registered dietitian reviewed the date and time stamped images. Each photographed eating occasion or food item was discussed with the participant and parent to identify additional details regarding the food type, portion size, and other characteristics (e.g., drinks, side dishes, ingredients, condiments, etc.). Food items, portion size, and specific details about any food items that were different from the record were recorded in different colored ink to distinguish the photo-assisted

record from the standard record. Additional details, including the reasons for the differences (e.g., forgot food, inaccurate portion size), number of meals captured by images, and total number of meals consumed, were also recorded.

All dietary records were entered into Nutrition Data System for Research (NDSR) software version 2011[117] by registered dietitians. The proxy-assisted records and the photo-assisted records were entered as two separate records. Dietary analysis from NDSR was used to determine total intake of calories, fat, carbohydrate, and protein.

Not all eating occasions were captured by digital photography due to participants eating lunch and some snacks at school; therefore, only the eating occasions that were captured by photo were analyzed and compared to the standard proxy-assisted 3-day food record.

The differences in energy (kcals) and macronutrient (grams of fat, carbohydrate, and protein) intake between the standard recall and the photo-assisted recall for each participant were measured using a mixed model. The mixed model was used to take care of the correlation among meals reported by the same participant. Models were adjusted for the participants' age, gender, race, and level of IDD severity (mild vs. moderate IDD), thereby improving the accuracy of the energy and macronutrient estimates. Statistical significance was determined at 0.05 alpha level, and all analyses were conducted using SAS (version 9.2, 2012, SAS Institute Inc) [103].

RESULTS

Diet records were collected from 20 participants (age = 14.9 ± 2.2 yrs., 45% female). Table 1 shows demographic data. Participants captured images for 53.8 ± 31.7% of all

eating occasions consumed at baseline and 47.2 ± 34.1% at the end of month 2. This resulted in the analysis of 212 eating occasions (130 at baseline and 82 at the end of month 2). There was an average of 2.6 ± 2.2 dietary differences (i.e., incorrect portion size, forgetting a food, etc.) per eating occasion between the standard and photo-assisted record at baseline and 2.5 ± 3.0 differences at the end of month 2. At baseline, the most common difference between the photo-assisted record and the standard record was incorrect portion size (37.4%), followed by forgetting a food eaten (32.1%), missing or incorrect details about food (28.2%), and reporting a food that was not actually consumed (2.3%). At the end of month 2, the most common difference was forgetting a food eaten (70.1%), followed by incorrect portion size (16.2%), incorrect or missing details about a food item (12.1%), and reporting a food not actually consumed (1.0%).

Table 1. Demographic data of all participants

	All Participants (n=20)
Variable	*n* (%)
Age (yrs) *M* ± *SD*	14.9 ± 2.2
Gender	
Male	11 (55%)
Female	9 (45%)
Race	
Asian	1 (5%)
Black	4 (20%)
White	14 (70%)
Mixed	1 (5%)
Ethnicity	
Not Hispanic/Latino	0 (0%)
Hispanic/Latino	20 (100%)
Level of IDD severity	
Mild	12 (60%)
Moderate	8 (40%)
Secondary Diagnosis	
Autism	9 (45%)
Down Syndrome	8 (40%)
Other	3 (15%)

After adjusting for age, gender, race, and level of IDD severity, photo-assisted records showed significantly higher estimates of total energy intake per eating occasion compared to standard records at baseline (standard = 429.3± 261.8 kcals vs. photo-assisted = 515.6 ± 330.8 kcals, p=0.001) and again at the end of month 2 (standard = 437.9 ± 229.6 kcals vs. photo-assisted = 489.7 ± 265.8 kcals, p=0.03). This resulted in a 16.7% increase in total energy reported per eating occasion at baseline and a 10.6% increase at the end of month 2. Photo-assisted records also showed significantly greater intakes of grams of fat (p=0.011), carbohydrates (p=0.003), and protein (p=0.004) at baseline and significantly greater intakes of grams of carbohydrates (p= p=0.007) at the end of month 2. Fat and protein intakes had no significant differences between record methods at the end of month 2.

Table 2. Reported energy and macronutrient intake using standard records compared to photo-assisted records per eating occasion at baseline and the end of month 2

	Standard record		**Photo-assisted record**		**Percent Difference**	**Difference**
	N	*M± SD*	*N*	*M± SD*	*%*	*p*
Energy (kcal)						
Baseline	130	429.4 ± 261.8	130	515.7 ± 330.9	16.7%	0.001 *
End of month 2	82	437.9 ± 229.7	82	503.0 ± 275.4	13.0%	0.022 *
Carbohydrate (g)						
Baseline	130	57.1 ± 36.1	130	67.5 ± 46.7	15.4%	0.003 *
End of month 2	82	59.0 ± 27.8	82	69.1 ± 34.9	14.7%	0.008 *
Fat (g)						
Baseline	130	16.0 ±13.0	130	19.5 ± 17.5	17.9%	0.011 *
End of month 2	82	14.6 ±12.8	82	16.9 ± 14.4	8.4%	0.150
Protein (g)						
Baseline	130	17.2 ±12.8	130	21.0 ± 19.4	18.0%	0.004 *
End of month 2	82	19.6 ±13.8	82	21.5 ± 14.3	9.4%	0.148

* Denotes significance at 0.05 alpha level using mixed modeling for repeated measures

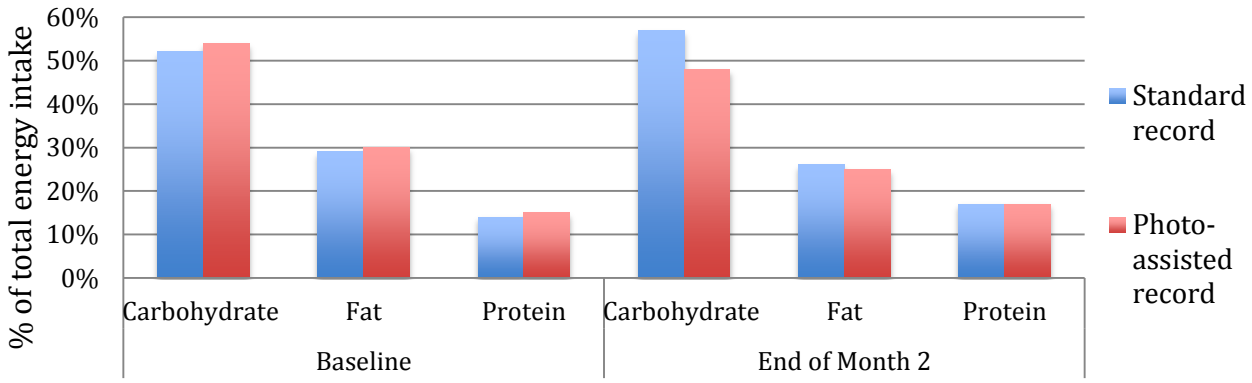


Figure 1. Macronutrient composition of standard and photo-assisted records of adolescents with IDD at baseline and the end of month 2

The macronutrient composition was evaluated to compare the standard and photo-assisted records at both baseline and the end of month 2 to examine whether certain types of foods were captured differently between methods (e.g., high carbohydrate foods, high fat foods, etc.). Figure 1 illustrates the macronutrient composition as a percent of total energy intake at baseline and the end of month 2 for both record methods, and shows that there was no statistical difference for the percent distribution of grams of fat, protein, or carbohydrates at either time point (all $p>0.05$).

DISCUSSION

This study was designed to determine whether photo-assisted food records provide a significant difference in reported energy and macronutrient intake when assessing 3-day food records in adolescents with IDD. The use of photo-assisted food records provided significantly greater total energy intake compared to proxy-assisted food records. These

large differences in caloric and macronutrient intake suggest that standard proxy-assisted food records may underestimate dietary intake amounts in this population.

Similar to previous studies using digital photography in adults with IDD, participants were able to capture images of their meals[56,77,78]. Participants were able to take photos of their food for 53.8 ± 31.7% of all eating occasions consumed at baseline and 47.2 ± 34.1% at the end of month 2. The rate of capture in this study is less than in previous studies using digital photography in adults. However, the main reason for not capturing a meal on camera that was reported on the food record was consuming a meal or snack while at school, where the mobile devices were not allowed. In this study, 37% of all eating occasions occurred at school.

A 16.7% increase in reported energy intake per eating occasion was identified at baseline, and a 13.0% increase was identified at the end of month 2. While these increases are significant, they are less than the 25.8% increase observed in adults with IDD using photo-assisted 24-hour recalls[78]. Although one cannot directly compare adolescents to adults, it can be suggested that the use of food records vs. food recalls in individuals with IDD may provide a better estimate of dietary intake, and the use of a proxy (staff or parent) may also benefit the accuracy of dietary intake.

There was a greater difference in energy intake reported between assessment methods at baseline compared to the end of month 2 (6.1% difference between baseline and month 2). All participants were enrolled in an 8-week healthy lifestyle intervention, which included dietary education. The knowledge parents and participants received from this intervention may have made them more aware of the foods they were eating, which may explain why there was a decrease in energy difference between photo-assisted records

and standard proxy records between baseline and the end of month 2. Participants and their parents may have become more knowledgeable about what they were eating and could report better details and more accurate portion sizes. They may also just have become more comfortable with the recall process. Another observed change was that, at the end of month 2, only 16.2% and 12.1% of the differences between record methods were due to incorrect portion size and incorrect or missing details about food, respectively, while at baseline these were 37.5% and 28.3%, respectively. This supports the theory that participants and parents either became more aware of what they were eating or grew more comfortable reporting portion size and specific details about food.

The macronutrient composition (percent calories from fat, protein, and carbohydrate) between record methods was not different at baseline or month 2, indicating that the significant increase in energy intake was responsible for the significant increases in macronutrient intake. Certain macronutrients, such as high fat foods, were not more likely to be underreported.

While this study highlights the value of using digital photography in combination with proxy-assisted food records in adolescents with IDD, several limitations do exist. All participants were enrolled in an 8-week healthy lifestyle intervention, which included dietary education. The knowledge they received from this intervention may have caused them to become better at reporting food intake, making the difference between the two methods smaller at month 2. However, the difference between recall methods was still significant in terms of energy intake, which demonstrates that, even with proper portion size and nutrition education, digital photography may still provide added value to food records. Another limitation is that participants were not randomly selected as they were

enrolled in a healthy lifestyle intervention, which may limit the generalizability of these findings. However, the results were adjusted for age, gender, race, and level of IDD severity to help account for this limitation. Finally, while the photo-assisted record method did show significant increases in estimates of dietary intake, this method is not yet validated in adolescents with IDD, and future validation studies need to be conducted.

The use of digital photography as a dietary assessment technique for adults with IDD has been published, however, this is the first known study to look at the use of digital photography for dietary assessments in adolescents with IDD. Although, future research needs to validate dietary assessment methods in adolescents with IDD, the use of photo-assisted diet records appears to be a feasible method to obtain substantial additional details about dietary intake of adolescents with IDD. Individuals working with adolescents with IDD may be able to use photo-assisted records to obtain more accurate dietary intake data, which is lacking in adolescents with IDD. Accurate dietary intake data would help design appropriate diets for weight loss and general health promotion, which is necessary to reduce chronic disease risk in adolescents with IDD[27,28,118].

CHAPTER FOUR:

A WEIGHT MANAGEMENT INTERVENTION FOR ADOLESCENTS WITH INTELLECTUAL AND DEVELOPMENTAL DISABILITIES: A PARENT'S PERSPECTIVE

ABSTRACT

INTRODUCTION: It has been suggested that successful weight management strategies for adolescents with intellectual and developmental disabilities (IDD) must not only influence diet and physical activity levels, but must change parental attitudes and behaviors. Thus, the ability of a parent to accept the program and change his or her own attitudes and behaviors could dictate whether a participant is successful or not. The purpose of this study was to obtain parental feedback and evaluation for an 8-week diet and physical activity intervention for adolescents with IDD. **METHODS:** Semi-structured interviews were conducted in 18 parents (48.1± 5.6year; 94% female) whose child had just finished a diet and physical activity program for adolescents (11-18yrs.) with IDD. Interviews were transcribed verbatim, and thematic analysis was conducted. **RESULTS**: The five major themes identified were acceptability of the diets, physical activity, use of the tablet computers, plans for the healthy eating and physical activity in the future, and changes in parents' own behaviors. Parents reported a positive attitude towards the program. They liked the convenience of the program, the use of the tablet computer, and felt they had learned beneficial strategies to continue to encourage healthy habits in the home. **CONCLUSION**: Results from the interviews indicated that parents were able to change their behaviors to help their adolescent successfully follow a weight loss intervention. However, parents of adolescents with IDD may place a larger emphasis on dietary intake compared to physical activity, and they may need more education about the benefits of physical activity and ideas on how to increase the physical activity in the home.

INTRODUCTION

Childhood obesity is a major concern in the United States. Adolescent obesity rates in the United States (U.S.) have more than tripled in the last 30 years, and approximately 31% of adolescents are overweight or obese (BMI ≥ 85th percentile), with 19% considered obese (BMI ≥ 95th percentile) [79]. Adolescents with IDD have significantly higher rates of obesity compared to typically developing adolescents[11-15,80]. For example, Rimmer et al[15] reports that 42% of adolescents with autism are overweight, with 25% being obese, and 55% of adolescents with Down syndrome are overweight, with 31% being obese. The high prevalence of obesity is a serious problem as studies show that obese adolescents are up to 4 times more likely to become obese adults and to develop chronic diseases, such as hypertension, type 2 diabetes, and metabolic syndrome, than their healthy weight peers [16-19].

Healthy People 2020, the National Institute on Disability and Rehabilitation Research, The Academy of Nutrition and Dietetics, the World Health Organization, and the Surgeon General's Report on Health and Wellness of People with Disabilities all recommend additional efforts to decrease the high prevalence of obesity among children, adolescents, and adults with IDD [3,27-29]. However, little research has been conducted to promote weight loss or weight management in adolescents with IDD [40].

Parents play an important role in the lives of adolescents with IDD, especially in terms of weight control, as they perform the food shopping and meal planning and preparation, and they often have a role in the physical activity level of their child[119]. Researchers believe that successful obesity prevention/intervention strategies for adolescents and children with IDD must not only influence diet and physical activity levels

of the adolescents and children, but must also influence parental attitudes and behaviors[120,121]. Thus, the ability of a parent to accept the program and change his/her attitude and behaviors during a weight management intervention could dictate whether a participant is successful or not.

Recently, a successful 2-month pilot intervention was conducted to determine the effectiveness of two weight loss diets, an enhanced stop light diet (eSLD) and a conventional diet (CD), and to determine the feasibility of using tablet computers as a weight loss tool in overweight and obese adolescents with IDD. Adolescents in both diet groups were successful at losing weight and appeared to enjoy the program. However, most adolescents were unable to provide detailed feedback or evaluation of the program.

The purpose of this study was to obtain parental evaluation of the components of the diet and physical activity intervention in terms of ease of use and feasibility, and to identify what parents want from a weight loss program to determine strategies that could inform future weight management programs for adolescents with IDD.

METHODS

Participants and recruitment

Participants were parents of adolescents (ages 11-18) enrolled in a diet and physical activity intervention for adolescents with IDD. Details on the diet and physical activity intervention can be found in chapter 2, but briefly, it was a 2-month weight loss intervention where participants were randomized into one of two diets: an enhanced Stop Light Diet (eSLD) or a conventional diet (CD). All participants were given a tablet computer (Apple iPad2) with which to track their dietary intake using the application Lose It! and

their physical activity (steps) using the applications iStep Log or Fitbit. The eSLD diet used portion controlled meals (PCMs), comprising two shakes and two entrées a day, and a color-coded stoplight guide to help participants choose healthy food items. The CD taught portion control and food groups servings according to the USDA MyPlate guide[94].

Only one parent was interviewed per household. In households with more than one parent, the parent most involved with helping the adolescent follow the diet and physical activity program was selected for the interview. Parents signed a university approved consent form (appendix A) when enrolling their dependent in the diet and physical activity intervention. Parents could opt out of the interviews even if their dependent participated in the intervention.

Data collection

After the participant's child completed their final assessments for the intervention, face-to-face semi-structured interviews were conducted using an interview guide (appendix B) developed by the researchers. The same interviewer conducted all interviews. The interviews began with parents filling out a demographic form to determine their age, gender, race, education level, and employment status. They were then asked semi-structured, open-ended questions tailored to their child's intervention group (eSLD or CD) addressing their general perceptions about the program. Interviews were performed in the participant's home and were audio-recorded. All interviews lasted 20-40 minutes.

Data analysis

All interviews were transcribed verbatim, and the transcripts were given to three independent researchers for coding and analysis. A thematic analysis was undertaken applying the constant comparison method[122]. Data were initially organized according to categories in the interview guide, and then major themes were formulated. The three researchers grouped data deductively into the major themes. Coded transcripts were triangulated by one researcher by cross-checking the codes for inter-coder agreement. Disputes among coders were resolved through consensus. Data were grouped into five major themes (appendix I). Representative verbatim comments were selected for presentation.

RESULTS

Out of the 20 adolescents that completed the pilot intervention, 18 parents were interviewed. Only one parent chose not to be interviewed due to privacy concerns, and another parent had two adolescents enrolled in the study. Parents were primarily female (94%), and all had a college degree. Sixty-six percent of parents worked full time, and 11% were not employed. Table 1 reflects the full demographic data of participants interviewed.

Table 1. Demographic data of all parents and parents segmented by child's diet group

	All parents (n=18)	Parents with children on eSLD (n=9)	Parents with children on CD (n=9)
Variable	%	%	%
Age (yrs)*	48.1± 5.6	49.1 ± 7.2	48.0. ± 4.8
Gender			
Male	1 (6%)	0 (0%)	1 (11%)
Female	17(94%)	9 (100%)	8 (89%)
Race			
Black	4 (20%)	4(44%)	0(0%)
White	14 (70%)	5 (56%)	9 (100%)
Other	0 (0%)	0 (0%)	0 (0%)
Ethnicity			
Not Hispanic/Latino	18 (100%)	9 (100%)	9 (100%)
Highest Level of Education			
High school/GED	0 (0%)	0 (0%)	0 (0%)
Associate's Degree	1 (6%)	0 (0%)	1 (11%)
Bachelor's Degree	11 (61%)	5 (56%)	6 (67%)
Graduate Degree	6 (33%)	4 (44%)	2 (22%)
Employment Status			
No job	2 (11 %)	0 (0%)	2 (22%)
Part-Time	4 (33%)	3 (33%)	1 (11%)
Full Time	12 (67%)	6 (67%)	6 (67%)

* *M* ± *SD*

Acceptability of Diets

Enhanced Stop Light Diet

The majority of parents stated that their child liked the PCMs and mentioned that the child found them to be "tasty", "easy", and "filling", while still allowing the child to choose their own meals. Parents had a positive attitude towards the meals and found them to be convenient, portion-controlled, simple to make, and nutritionally adequate. Most schools allowed the adolescents to prepare their PCMs in a microwave during lunchtime. Furthermore, they were pleased that their child was able to prepare the meals without assistance.

"I liked them, they really helped, especially at lunch time. And it really helps me because you know how busy we are. It helps us not to have to worry, um, about what she's going to eat. And like… because if any other given day she would just go in the refrigerator and get like whatever was there that she liked, in undisclosed amounts. And that was the hardest thing… it was like how much did you eat? Now it's just easy for her. She's like 'oh wow'… pop it in the microwave for a minute, and she's set. And a lot of times when I got home I'm like 'Did you eat yet?', and she's like 'Yeah, I already ate!' And it was just really nice to know."

Problems that caused families to not use PCMs were going out for dinner or having someone else take care of the adolescent; however, most parents felt their child could make healthy food choices using the stop light guide in place of the PCMs.

"Regardless of what setting he was in, we encouraged the healthy eating. The red foods, green foods, yellow foods was helpful because when he was with his grandmother she could say to him, 'No, that's a red food,' to manage that system."

Most parents thought the stop light guide was a good tool that complemented the PCMs; however, a few reported that they did not use the guide as they felt they could figure out what was a healthy food to feed their child on their own. Most parents thought their child could understand the guide and could use it to pick out healthy food choices.

Conventional Diet

Parents whose child was in the CD group felt that their dependent benefited the most from education about proper portion size and that portion control caused the diet to be successful. Many parents reported they gained knowledge about correct portion sizes as well and could then provide their adolescent correct portion sized choices at mealtimes or help them to portion out food.

"I really enjoyed him learning about portion size. I think portion size was the most important thing here because he eats big food, like grizzly bear sized portions, and he thought that was ok to do. Doing this program he really learned what a portion size was and saw that he needed to cut back. I even learned what a real portion size was and that maybe I was feeding him too much."

The main struggle related to the conventional diet was trying to get the adolescents to eat the recommended five fruits and vegetables during the day. Some parents admitted their child had an aversion to fruits and vegetables; others just struggled to get enough in during the day.

"Also, trying to increase his fruits and vegetable was hard. Again he doesn't have a big variety of foods he likes to eat, but we've been trying to just keep the things on hand that he will eat, but he is just not a fruits and vegetables kind of guy."

Parental Suggestions for Both Diets

Suggestions for improvements in both diet groups were educating teachers as well as the parents and participants, increasing the length of the program, allowing parents to also have an iPad, providing money to buy more fruits and vegetables, and providing healthy cooking recipes. All parents reported that they would do the program again if given the chance.

Physical Activity

Most parents reported that their child's main form of exercise was playing on the Nintendo Wii system. Other common forms of exercise reported were school-related physical activity (gym class or sports teams) and Special Olympics sports. Some parents mentioned that they had a treadmill or elliptical machine at the home and that their child would use it occasionally. Only two parents had a gym membership for their child.

"Mostly just the Wii. She does the sports at school, and then she's got the dance with her Special Olympics group, and she likes both, oh, and dance. She loves her dance classes."

Parents did not seem to place a large emphasis on exercise, and no parent did physical activity with their dependent. Many parents commented on why they didn't encourage more exercise or do exercise with their child.

"Anyway, no, he didn't do a lot of exercise. It's hard for me to get him to because I work evenings. Even though I'm off on Saturday, we don't belong to the gym or anything; it's gotten too cold to go outside so we just didn't do much, and I think he is fine with that."

Use of the tablet computer

All parents liked using the tablet computer as a weight loss tool. They felt that the tablet made their child want to participate in the program and that it made healthy eating and exercise fun. Common words used to describe the tablet and the applications used on the tablet were "easy", "visually appealing", and "portable".

"Well, I liked that it was so portable. We took it with us even when we went out to eat. A lot of times we were able to just enter things in right there. He uses it a lot, so it's just so handy. It's not like if we had a separate book or something separate we'd have to do it with. He is a kid with an iPad: he wants it with him all the time. I think it's just very … makes it just really acceptable. It fits his lifestyle."

Parents felt that the Lose it! application was a good learning tool for adolescents with IDD, especially because it was very visually appealing and easy to understand. They conveyed that it was easy to maneuver and that their child was able to do it without a lot of help, although most noted that they would help their child from time to time with entering things.

"I like that it was easy for him to use and that he was the one that was doing it, not me. It was easy and fun for him to do that"

The biggest problem encountered using the tablet and the applications was remembering to record their foods everyday into the Lose it! and iStep Log applications.

"Nothing was hard to do on the iPad, just remembering to do it was the thing he struggled with the most".

Plans for healthy eating and physical activity after the intervention

All parents were going to continue using the weight management strategies they learned during the intervention in the future. The majority of parents were going to download the application "Lose It!" and have their child continue to track his or her dietary intake and physical activity. Parents indicated that they planned to continue trying to increase the amounts of fruits and vegetables they were serving and to monitor the portion size of the foods they prepared. Parents whose child was in the eSLD group mentioned that they were going to purchase low-calorie frozen entrees from the grocery store so that they could continue to have PCMs in the house that their child could use for lunch and dinner options.

"We will continue to use the app. We will continue to use the pre-portion meals. We'll continue to use basically all of the information that you shared with us. I feel good about this."

Changes in Parents' own habits

Parents' own dietary habits changed because of their child participating in this program. They became more aware of portion sizes and really tried to serve the correct portion sizes to the entire family, tried to choose healthier restaurants when eating out, and tried to serve more fruits and vegetables at meal times and for snacks.

"We (the family) aren't going out to eat as much. I'm just really looking at portion sizes and trying to make sure I try to get more fruits and vegetables. I think everything that we are trying to get for him, I am doing, too. It's not like he was eating separate food from us. What he was doing, we were doing. By him making better choices and us making better choices for him, I am doing the same for myself and the rest of the family. I think it's definitely been beneficial for probably all of us, the whole family."

While dietary habits appeared to change, parents did not report changes in their own physical activities levels. Most said that they were already physically active and that they just kept doing their own routine, while others noted that they just didn't feel they had time to do physical activity.

"I have taken more of a focus on accomplishing professionally rather than focusing everything on him, and, so yeah, I just don't have time. Single moms have a lot to do. We have to prioritize, and exercising is just not one of my priorities right now."

DISCUSSION

As there are currently no recommended weight management strategies for adolescents with IDD and minimal research has been conducted for weight loss and weight management strategies for this population[40], it is unknown what diet strategies are most appropriate for weight management in adolescents with IDD. Previous research shows that parents play a large role in terms of weight management in adolescents with IDD[119-121]. Thus, this study was important in exploring what parents did and did not like about a diet and physical activity program, to determine what strategies would be successful or what aspects programs need to be addressed in weight management programs for adolescents with IDD.

An equal number of parents from each diet group completed the interview process, and themes were analyzed for diet acceptability, tablet computer use, physical activity, future plans for healthy eating and physical activity after intervention completion, and parent behavior change. Overall, the program was highly accepted and supported by parents in both diet groups. All parents indicated they would do the program again if given

the chance. The tablet computers were an acceptable tool for weight loss as parents felt that their children could use them with minimal assistance and enjoyed using them.

Parents appeared to respond well to the program because they felt it was easy for their child to understand, it was appealing for their child, and it decreased parent burden. The interviews suggest that parents of adolescents with IDD want a program that will allow their child to lose weight but will not require a lot of time commitment and burden on the parents' end.

Those parents who were interviewed understood and were pleased with the dietary components of the both diet groups. Parents whose child was in the eSLD group enjoyed the use of PCMs, and parents whose child was in the CD group benefited from portion size education. The self-reported behaviors of parents in both diet groups changed as a result of the program: parents began to increase their intake of fruits and vegetables and to decrease the portion sizes they were eating. These dietary behaviors changes are significant, as research has found that children and adolescents who have parents that model healthy dietary behaviors have a decreased risk of obesity[123-125].

Parents appeared to emphasize the dietary component of the intervention over the physical activity component. While parents seemed very involved with helping their child select healthy food options and record their dietary intake, they relied on the school or Special Olympics to provide physical activity options. Even those who obtained gym memberships or had gym equipment in their home did not put a lot of effort into getting their dependent to use the equipment. No parent recounted performing physical activity as a family, such as going on walks. Furthermore, while parents' dietary habits seemed to have improved because of this program, parents' own physical activity did not change, again

suggesting that parents were not as involved in encouraging physical activity as they were with changing dietary habits. These results suggest that when designing a successful weight management intervention parents must be taught the importance of physical activity and taught ways to encourage their child as well as the whole family to engage in physical activity.

While this study demonstrates parental acceptability of two different diet strategies (eSLD and CD) for weight loss in adolescents with IDD, there are some limitations to this study. All parents were well educated as they all had a college degree and many had graduate degrees; thus, this may limit the generalizability of our findings.

CONCLUSIONS

The current study explored parental evaluations of a weight loss program for adolescents with IDD. Overall, parents had a positive attitude towards the program regardless of which diet group their child followed. They enjoyed the convenience of the program, appreciated the use of the tablet computer, and felt that they had learned beneficial strategies to continue encouraging healthy habits in the home. Results from the interviews indicate that parents want a weight management program that is geared towards the adolescent and does not add extra stress and burden to themselves as a parent. Furthermore, it appears that parents of adolescents with IDD may place a larger emphasis on dietary intake compared to physical activity, and may need more physical activity education and ways to increase physical activity of the participant and the family. As parents of adolescents with IDD typically do the food shopping, perform the meal planning and preparation, and often have a role providing outlets for physical activity, their

views and opinions on weight management strategies are vital and should be taken into consideration when developing and conducting weight management programs and interventions.

CHAPTER FIVE:

DISCUSSION AND CONCLUSION

SUMMARY OF FINDINGS

This series of studies aimed to (1) compare the effectiveness of two weight loss diets, an enhanced stop light diet (eSLD) and a conventional diet (CD), in overweight and obese adolescents with IDD, (2) to determine the feasibility of using tablet computers as a weight loss tool in overweight and obese adolescents with IDD, (3) to determine if the use of photo-assisted 3-day food records significantly increased the amount of energy and macronutrient intake reported in proxy-assisted 3-day food records in adolescents with IDD, and (4) to evaluate the intervention components of the program by assessing parents' feelings and opinions regarding the intervention programs.

Overall, the results show that weight loss and weight management programs in adolescents with IDD can be successfully conducted, with overall acceptability from both adolescents and parents. The results demonstrate two weight management strategies that may potentially lead to clinically significant weight loss in adolescents with IDD. Participants' success in logging diet and physical activity data showed that tablet computers are a feasible tool and delivery system for weight loss in adolescents with IDD. Comparison of photo-assisted food recalls to proxy-assisted recalls demonstrated that photo-assisted 3-day food records may provide more accurate estimates of energy intake in adolescents with IDD compared to proxy-assisted 3-day food records. Finally, the interviews suggested that parents will change in order to help adolescents with IDD follow a diet and physical activity program and appeared to approve of the approach used in this study.

To our knowledge, this is the first weight loss intervention incorporating the use of technology in adolescents with IDD. We found that both the CD and the eSLD might be effective weight loss strategies in adolescents with IDD. Participants in the eSLD had a mean weight loss of 3.89 ± 2.66 kg, compared to participants in the CD who had a mean loss of 2.22 ± 1.37 kg (p=0.0720), which constitutes a loss of 4.6% and 3.3% body weight, respectively. Decreased sedentary activity time and decreased caloric intake contributed to this weight loss. Both groups had a significant decrease in sedentary activity time and in caloric intake, with a significant caloric reduction of 844.9 ± 641.0 kcal/day (p=0.0024) in the eSLD and 674.9 ± 769.4 kcal/day (p=0.0301) in the CD. Furthermore, participants in both groups increased their diet quality as measured by the HEI-2005. The eSLD group increased by 6.6 ± 11.0 points, and the CD group increased by 2.8 ± 7.3 points.

We found that adolescents with IDD were able to use the tablet computer to track their dietary intake a median of 90.40 % (range: 27.8%-100%) of total days, enter their steps 64.3% (range: 0-100%) of total days, and speak with a health educator over video chat 80% of the scheduled weekly meetings. Most adolescents in this study (95%) reported enjoying the use of the tablet computers, and 42% were able to complete tablet computer tasks without assistance. These results suggest that tablet computers are a feasible weight loss tool and delivery system for adolescents with IDD.

DIGITAL PHOTOGRAPHY PROVIDES BETTER ESTIMATES OF DIETARY INTAKE IN ADOLESCENTS WITH INTELLECTUAL AND DEVELOPMENTAL DISABILITIES

We examined the use of digital photography in assessing dietary intake of adolescents with IDD. The results of this study found that adolescents with IDD are able to take images of their meals, as participants captured 53.8 ± 31.7% of all eating occasions consumed at baseline and 47.2 ± 34.1% of all eating occasions at the end of month 2. These results are similar to the studies done in adults with IDD[77,78]. Furthermore, we found that the use of photo-assisted food records significantly improved estimates of energy by 16.7% ($p=0.0006$) at baseline and 10.6% ($p=0.0305$) at the end of month 2 compared to use of proxy-assisted food records. Our results suggest that the use of digital photography in combination with proxy-assisted food records may improve estimates of energy intake and macronutrient intake in adolescents with IDD.

A WEIGHT MANAGEMENT INTERVENTION FOR ADOLESCENTS WITH INTELLECTUAL AND DEVELOPMENTAL DISABILITIES: A PARENT'S PRESCRIPTIVE

We explored parental perceptions of the intervention by conducting semi-structured interviews with participant's parents. The five major themes identified were acceptability of the diets, physical activity, use of the tablet computers, plans for healthy eating and physical activity in the future, and changes in parents' own behaviors. Parents had a positive attitude towards the program and liked the convenience of the program, appreciated the use of the tablet computer, and felt that the program taught beneficial strategies to continue to encourage healthy habits in the home. The results from the interviews suggested that parents were able to help the adolescent successfully follow a weight loss intervention. The interviews also indicated that parents want a weight

management program that is geared toward the adolescent and that does not add extra stress and burden to themselves as parents. Furthermore, it was observed that parents may place a larger emphasis on dietary intake compared to physical activity and may need more education about the benefits of physical activity and ideas on how to increase the physical activity of adolescents with IDD.

CLINICAL SIGNIFICANCE

The rates of obesity and risk of developing chronic diseases are high in adolescents with IDD[15-19,126]. The results of these studies suggest that the eSLD and the CD are both feasible weight management strategies for adolescents with IDD and that the use of tablet computers is a feasible delivery system for weight management in adolescents with IDD. Furthermore, the use of both the eSLD and the CD could potentially lead to significant weight loss as well as increases in diet quality and decreases in sedentary activity time in adolescents with IDD, all of which have the potential to decrease the risk of developing chronic diseases.

The results of these studies also suggest that valid dietary assessment techniques need to be developed for use in adolescents with IDD. Digital photography in combination with proxy-assisted food records is feasible and may improve the estimations of dietary intake of adolescents with IDD. Individuals and medical professionals working with adolescents with IDD should be cognizant of the limitations of conducting dietary assessments in adolescents with IDD and should be aware that underreporting may occur.

LIMITATIONS

The present studies were self-funded pilot studies; thus, they were small in sample size and lacked power to identify significant differences between groups. The intervention period was only two months, while most weight loss interventions are typically 3-6 months in duration[127] . Furthermore, there was no follow-up period to determine if the participants were able to maintain the weight loss they achieved.

FUTURE DIRECTIONS

While we identified two diets that may be successful weight loss strategies in adolescents with IDD, long-term, adequately powered studies are needed to determine if the eSLD is more effective in terms of weight loss in adolescents with IDD, as well as if either diet results in continued weight management after the weight loss period concludes.

Furthermore, while the tablet computer appears to be a feasible weight loss tool for adolescents with ID, future studies need to determine if the use of technology as a delivery system for weight loss is more effective than traditional dietary and PA tracking and face to face education as seen in the study by Saunders et al[37].

Finally, in order to accurately assess the dietary intake and diet quality of adolescents with IDD in general, valid dietary assessment methods are needed. While photo-assisted 3-day foods records appear to be a feasible method of collecting more accurate dietary intake information in adolescents with IDD, it is still not a validated method of dietary assessment in this population. Validation studies need to be conducted to determine if photo-assisted recalls in conjunction with 3 day proxy-assisted food records can be used to provide valid dietary assessment data in adolescents with IDD. Common

validation practices include comparisons of the dietary assessment method against other similar methods[128], comparisons of the dietary assessment to direct observation of meal consumption[129], and the use of double-labeled water [130-132] . As no other validated dietary assessment method exists in this population, direct observation or the use of double-labeled water would be the best techniques.

CONCLUSIONS

The results of the present studies suggest that weight loss interventions in adolescents with IDD are feasible and that the use of both the eSLD and the CD may be successful strategies to promote weight loss in this population. Additionally, the use of technology in the form of tablet computers also appears to be a feasible and appealing strategy to deliver weight loss interventions. Furthermore, using technology may help to provide a more accurate dietary assessment method in adolescents with IDD via the use of digital photography. Future research will benefit from the use of the strategies developed in these studies to discover ways to promote weight loss in adolescents with IDD to help lower the increased risk of obesity and chronic diseases that affects this population.

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APPENDIX A:

CONSENT FORMS

Legal Guardian Consent
KU Diet and Physical Activity Program

INTRODUCTION
The University of Kansas supports the practice of protection for human subjects participating in research. The following information is provided for you to decide whether you wish to participate and allow your dependent to participate in the present study. You may refuse to sign this form and your dependent will not be able to participate in this study. You should be aware that even if you agree to participate, you are free to withdraw at any time. If you do withdraw from this study, it will not affect you or your dependent's relationship with this unit, the services it may provide, or the University of Kansas.

PURPOSE OF THE STUDY
This study is designed to compare two different diets and how these diets influence body weight across 2 months in adolescents, with mild to moderate Intellectual and Developmental Disabilities (IDD).

PROCEDURES
The procedures for this study are outline below.

Inclusion/Exclusion Criteria
Individuals are **eligible** if they meet the following criteria:
- 11-18 years of age
- Diagnosis of an intellectual and developmental disability
- Ability to provide consent from their personal physician to participate in this study.

Individuals will be **ineligible** if they report any of the following criteria:
- Insulin dependent
- Participation in a weight reduction program involving diet and PA in the past 6 months.
- Current treatment of eating disorders, consuming special diets (vegetarian, Atkins, etc.), or diagnosis of Prader-Willi Syndrome.
- Currently pregnant, planning on or becoming pregnant during the study.

Prior to starting the study, you and your dependent will be asked to complete/obtain the following:

Dependent Physician Release We will ask you to provide a physician release form to determine if your dependent can participate in this study. This form will be provided to you and will include a description of the program. This form will need to be reviewed and signed by your dependents physician prior to starting the program. This form is only needed at baseline (before your dependent starts the program).

Health History Form: We will ask you to complete a Health History form for your dependent and this will be used to determine past and current health issues that may affect your dependent's eligibility status. This form will also inquire about basic demographic information about your dependent such as age, gender and ethnicity. This will occur at baseline only (prior to starting the study) and will take about 10 minutes.

INTERVENTION

Adherence to the protocol will involve one guardian serving as the primary family contact who will partner with research assistants (RAs) in conveying the principles of the intervention (diet/PA) to your dependent. The guardian will be asked to help their dependent follow the study protocol.

Diet: All eligible participants who are overweight or obese will be assigned randomly to one of two diet groups. You or your dependent will not be able to pick the diet group assigned.

- Conventional Diet: focuses on portion control and is low in fat and includes fruits, vegetables and low calorie snacks.

- Enhanced Stop Light Diet: Follows a plan that concentrates on healthy food choices and uses low-fat prepackaged meals (provided by the study) and includes fruits, vegetables and low calorie snacks.

All eligible healthy weight participants will be assigned to either the conventional or enhanced Stop Light Diet, but both diets will be modified to focus on making healthy food choices, increasing fruits and vegetable intake, and promoting weight maintance.

Physical Activity: All diet participants will be asked to perform physical activity (PA) that will progress slowly to 300 minutes of exercise per week.

Tablet Computer: A tablet computer will be provided for use during the 8-week study and will be used to assist with menu planning, self-monitoring, feedback, data reporting and video chat meetings.

If your dependent breaks/destroys the tablet computer they will not be held accountable, and if available, another tablet will be given to them to use for the remainder of the study. All tablets will be protected with a sturdy cover to help reduce risk of damage. If the computer is lost, there is a tracking application built into the computer to help find it. If the tablet cannot be found, your dependent will still not be held accountable. Tablet computers must be returned to research staff after the 8 week study.

Educational Sessions:

Monthly in-person sessions: The study participant (your dependent) and a guardian (you) will attend home meeting sessions lasting about 90 minutes. These sessions will be conducted before the program starts (baseline) and at the end of months 1 and 2.

Weekly Face-time sessions: Weekly 20 minute video chat meetings will be held between a study educator, your dependent, and you via a tablet computer provided to the participant during the study. The weekly video chat meeting will provide opportunities to answer questions and provide feedback to the participant.

ASSESSMENTS
The following assessments will occur at the residence of the participant or at a mutually agreed upon location:

Dependent body weight, height and waist size We will measure your dependent's height and weight. We will measure the waist with a measuring tape. Your dependent will be asked to not consume food or drink (may drink water) for 12 hours prior to these measurements. We will ask your dependent to remove shoes and put on a t-shirt and shorts prior to these measurements. These assessments will occur at baseline (before your dependent starts the diet), and at the end of months 1 and 2. This will take about 5 minutes to complete each time.

Dependent Physical Activity Monitor Your dependent will be asked to wear a small device that measures physical activity for 4 consecutive days (2 week days and 2 weekend days) on two separate occasions. The device is small and light weight and about the size of a pager. Your dependent will be asked to wear the device on an elastic belt over the hip during all waking hours in the 4-day testing period. Your dependent does not need to wear the device when in bed or bathing. This 4-day period will occur at baseline and at the end of month 2. Your dependent will wear an electronic pedometer (step counter) during waking hours for the 2 month study.

Dependent Diet Intake We will ask your dependent to tell us the foods they ate during the past 24 hours on 3 different, consecutive days (2 week days and 1 weekend day) using photo assisted food records. Your dependent will be asked to take before and after photos (using the provided tablet computer camera) of all food and beverages consumed over the assigned three days in addition to a parent/guardian assisted hard copy diet record. This 3-day photo assisted food record will occur at baseline (before the start the program) and at the end of months 2. At the end of month 1 your dependent will be asked to tell us what foods they ate during the past 24 hours for only1 day and take photos of those meals. Each assessment (diet intake) will take about 15 minutes to complete.

Parent Interview At the end of the study (end of month 2), guardians will be asked to complete a semi-structured interview assessing the perceived helpfulness, acceptability, and ease/burden of the program.

Tablet Questionnaire At the end of months 1 and 2 your dependent will be asked to complete a questionnaire assessing their comfort using the tablet computer to track their food and physical activity, using the video chat, and taking photos.

Tracking Records We will ask you and your dependent to record what your dependent eats/drinks and their physical activity daily on the tablet computer across the 2 months study. The research staff will review the records at the end of each month.

RISKS

Dependent Exercise Possible effects of exercise are muscle soreness, fatigue, nausea, dizziness. In rare occasions there are unpredictable changes in blood pressure or heart rhythm, and heart attack.

BENEFITS

Your dependent's participation in this study may result in the reduction of health risk factors. Participation in exercise may improve your dependent's fitness, muscular strength and flexibility. Your dependent may lose body weight, body fat, or both. Your dependent may gain knowledge related to diet and physical activity.

COMPENSATION

Your dependent will receive either free prepackaged meals or a stipend for fruits and vegetables for 8 weeks depending on the diet they are assigned. Participants assigned to the Usual Care diet will receive $2.00 per day to purchase fruits and vegetables and this will be provided in the form of a gift card at baseline and at the start of month 1 and month 2. Investigators may ask for your dependent's social security number in order to comply with federal and state tax and accounting regulations. Your dependent will also have use of the tablet computer for 8 weeks before returning it at the end of the study and he/she will earn free download of applications (approved by parent) for compliance to the protocol.

PARTICIPANT CONFIDENTIALITY

Your dependent's name will not be associated in any publication or presentation with the information collected about your dependent or with the research findings from this study. Instead, the researcher(s) will use a study number rather than your dependent's name. Your dependent's identifiable information will not be shared unless required by law or you give written permission.

Permission granted on this date to use and disclose your information remains in effect indefinitely. By signing this form you give permission for the use and disclosure of your dependent information for purposes of this study at any time in the future.

AUTHORIZATION TO USE OR DISCLOSE (RELEASE) HEALTH INFORMATION THAT IDENTIFIES YOU FOR A RESEARCH STUDY

To perform this study, researchers will collect information about your dependent.
The information collected about your dependent will be used by Dr. Joseph Donnelly, his research staff, KU's Center for Research and officials at KU that oversee research, including committees and offices that review and monitor research studies. In addition, Dr. Donnelly and his team may share the information gathered in this study, including your dependent's

information, with government officials who oversee research, if a regulatory review takes place.

Some persons or groups that receive your health information as described above may not be required to comply with the Health Insurance Portability and Accountability Act's privacy regulations, and your health information may lose this federal protection if those persons or groups disclose it. The researchers will not share information about your dependent with anyone not specified above unless required by law or unless you give written permission.

Permission granted on this date to use and disclose your dependent's information remains in effect indefinitely. By signing this form you give permission for the use and disclosure of your dependent's information for purposes of this study at any time in the future.

SHARING OF INFORMATION
Additionally, you authorize your dependent's special education professionals, physical education teachers and school food service staff to attend meetings and request and receive information regarding your dependent's progress and participation in the diet research project. You understand that this Authorization can be revoked at any time to the extent that the use or disclosure has not already occurred prior to your request for revocation.

INTERNET STATEMENT
The weekly video chat meetings will be conducted solely between the health educator, your dependent and you. It is possible, however, with internet communications, that through intent or accident someone other than the intended recipient may see your dependent's response.

INSTITUTIONAL DISCLAIMER STATEMENT
In the event of injury, the Kansas Tort Claims Act provides for compensation if it can be demonstrated that the injury was caused by the negligent or wrongful act or omission of a state employee acting within the scope of his/her employment.

REFUSAL TO SIGN CONSENT AND AUTHORIZATION
You are not required to sign this Consent and Authorization form and you may refuse to do so without affecting your right to any services you are receiving or may receive from the University of Kansas or to participate in any programs or events of the University of Kansas. However, if you refuse to sign, your dependent cannot participate in this study.

CANCELLING THIS CONSENT AND AUTHORIZATION
You may withdraw your consent to participate in this study at any time. You also have the right to cancel your permission to use and disclose further information collected about your dependent in writing, at any time, by sending your written request to:

Joseph E. Donnelly, ED.D.
Professor
University of Kansas

1301 Sunnyside
Robinson room 100
Lawrence KS, 66045

If you cancel permission to use your dependent's information, the researchers will stop collecting additional information about your dependent. However, the research team may use and disclose information that was gathered before they received your cancellation, as described above.

QUESTIONS ABOUT PARTICIPATION

Questions about procedures should be directed to the researcher(s) listed at the end of this consent form.

PARTICIPANT CERTIFICATION:

I have read this Consent and Authorization form or I have had it read to me. I have had the opportunity to ask, and I have received answers to any questions I had regarding the study. I understand that if I have any additional questions about my dependent's rights as a research participant, I may call Kansas Human Subjects Committee (785-864-7429), write the Human Subjects Committee Lawrence Campus (HSCL), University of Kansas, 2385 Irving Hill Road, Lawrence, Kansas 66045-7568, or email irb@ku.edu.

I give permission for my dependent to take part in this Study as a research subject. I further agree to the uses and disclosures of my dependent's information as described above. By my signature I affirm that I have received a copy of this Consent and Authorization form.

_____
Print Name of child participant

_____
Print Name of Legal Guardian

_____ _____
Signature of Legal Guardian Date

ASSENT FORM

Weight loss and Weight Maintenance Diet and Exercise Program

We want to find out if certain foods help you have a healthy body weight and if exercise will improve your health. There will be two different healthy food diet programs. If you decide to join the program you will be assigned to one of the two available programs. You will not be able to pick the program that you receive. One program uses prepackaged foods that you warm up. The other program uses foods that are not in prepackaged containers. Both programs include fruits and vegetables and healthy snacks and performing exercise (like walking and swimming). You will use a tablet computer during the study. The tablet computer will be used to help plan and track your diet and exercise program. We will also use the tablet computer to have video meetings where we will talk about the diet and exercise program. The program will last for 2 months (8 weeks). You do not have to join the program and can ask questions any time. Please talk about the program with your guardian/parent. Your guardian/parent will need to say it is ok for you to join the program. If you decide to join the study, we will ask you to do the following measurements where you live or a place you and your parent would like to meet.

1. We will ask you to provide a form from your doctor saying it is ok for you to be in this program.

2. We will measure how tall you are, how much you weigh and the size of your waist using a measuring tape. These tests will happen 3 times. The test will happen at baseline (before the study starts) and at the end of months 1 and 2. It will take about 5 minutes each time we do this test.

3. We will ask you to wear a small monitor around your waist for 4 days. This will track how much you move. These tests will happen 2 times. This test will happen at baseline (before the study starts) and at the end of month 2. We will ask you to wear the monitor when you get up in the morning and take off the monitor when you go to bed. Do not wear the monitor when bathing.

4. We will ask you to take a picture of the food you eat before and after you eat the food for 3 days in a row. We will ask you to take a picture at baseline (before the study starts) and at the end of months 1 and 2. After you take pictures of your food, we will look at these pictures as ask you questions about the food in the pictures. This will take about 15 minutes each time we ask you about the food in the pictures.

5. We will ask you to track your exercise and what you eat on a daily bases on a tablet computer during the time you are in the study (2 months). We will review your records in person with you at the end of month 1 and end of month 2. It will take about 15 minutes when we discuss your exercise and diet records

6. We will ask you questions about how much you or don't like to use the tablet computer to track your exercise and what you eat and how much you like or do not like doing the video chat and take photos. We will ask you these questions at the end

of month 1 and end of month 2. These questions will take about 10 minutes each time.

7. We will ask you and your guardian to complete questions about your health so we understand if can participate in the study.

BENEFITS

Will this program help you? We will learn if the way food is made and performing exercise will make you healthier. If you decide not to participate, you will not be in trouble.

Would you like to take part in the program?

APPENDIX B:

QUESTIONNAIRES

IDD Adolescents Weight Loss Project

Health History Form

Intake date: _____/_____/_____

KU faculty/staff present: _____

Participant name: _____

Parent name:_____

Address: _____

Tel. number: _____ Cell number: _____

Email: _____

DOB: _____

Gender: ☐ Male ☐ Female

Does individual meet the definition of someone with DD ☐ Yes ☐ No

Is the participant able to walk ☐ Yes ☐ No

Is the participant able to communicate foods eaten during the day ☐ Yes ☐ No

Level of Support:
☐ Mild (intermittent reminders, few activities with direct assistance)
☐ Moderate (direct assistance, few activities with reminders or occasional support)

Secondary Diagnosis:
☐ Autism
☐ Down syndrome
☐ Other/Not otherwise specified

Chronic health related conditions: (*check all that apply, first 3 make eligible*)
☐ Diabetics who use insulin
☐ Pregnancy
☐ Metabolic disorder such as Prader Willi Syndrome
☐ Hypertension
☐ Type 2 diabetes
☐ Asthma

☐ Food allergies (e.g., lactose, gluten, nuts, etc.) _____

Race of participant:
☐ American Indian/Alaska Native
☐ Asian
☐ Pacific Islander
☐ Black or African American
☐ White
☐ Two or more races

Ethnicity:
☐ Not Hispanic or Latino ☐ Hispanic or Latino

Living arrangement: How many people live in your house? (e.g., 1=alone)
☐1
☐2
☐3
☐4
☐5
☐6

Living arrangement: How siblings live in your house? (e.g., 1=alone)
☐1
☐2
☐3
☐4
☐5
☐6

Do you eat breakfast out? ☐ No ☐ Yes _____x per week

Do you eat lunch out? ☐ No ☐ Yes _____x per week

Do you eat dinner out? ☐ No ☐ Yes _____x per week

Do you eat pre-prepared meals? (pizza, sub sandwiches, etc.)
☐ Never
☐ 1-2 x week
☐ 3-4 x week
☐ 5-6 x week
☐ Daily

Describe:

A typical breakfast _____

A typical lunch _____

A typical dinner _____

Do you have a blender? ☐ No ☐ Yes

Do you have a weight scale? ☐ No ☐ Yes Food Scale ☐ No ☐ Yes

How often do you exercise?
☐ Never ☐ 1-2 x week ☐ 3-4 x week ☐ 5-6 x week ☐ daily

Type of exercise (Check all that apply)
☐ Walking
☐ Swimming
☐ Biking/stationary bike
☐ Weight/resistance training
☐ Special Olympics
☐ Sports (basketball, tennis, etc)
☐ Other _____

Where do you exercise?
☐ Home
☐ School
☐ Recreation center
☐ Other

How do you think you will benefit by losing weight? (*check all that apply*)
☐ Ability to be more physically active (greater mobility)
☐ Better health
☐ Other _____

What prevents you from losing weight? (*check all that apply),*
☐ I don't want to (lack of personal effort)
☐ Lack of social support
☐ Cost for family (personal finances)
☐ Lack of knowledge on how to
☐ Problems acquiring healthy foods
☐ Limited food selection
☐ No accessible exercise alternatives
☐ Food aversions
☐ Other _____

☐ Physician diet and physical activity release signed
☐ Consent to Participate signed

IDD Adolescent iPad Survey

Participants name:_____ Time Point: Month 1 Month 2

Please circle the response that best represents how you feel about using the iPad.

1. **How much did you like using the iPad? (circle one)**

   Disliked Neither disliked or liked Liked

2. **Using the iPad was_____? (circle one)**

   Very Hard Hard OK Easy Very Easy

3. **Writing down your food with the iPad was_____? (circle one)**

   Very Hard Hard OK Easy Very Easy

4. **Writing down your exercise with the iPad was_____? (circle one)**

   Very Hard Hard OK Easy Very Easy

5. **Writing down your steps with the iPad was_____? (circle one)**

   Very Hard Hard OK Easy Very Easy

6. **Taking pictures with the iPad was_____? (circle one)**

   Very Hard Hard OK Easy Very Easy

7. **Did you need help taking pictures with the iPad? (circle one)** Yes No

   a. **If you circled yes, who helped your take pictures?**

      Parent Other, please specify_____

8. **How much did you like playing games on the iPad? (circle one)**

   Liked a lot Liked Unsure Did not Like Really did not like

Other comments:

_____

_____

_____

<u>Semi-Structured Interviews</u>

eSLD SEMI-STRUCTURED INTERVIEW GUIDE

Topics	Main Question	Follow-up Question	Probes
Prepackaged Meals	Tell me about your experience with the portion controlled meals?	What did you most like about the meals? Tell about times when you did not eat the meals?	
Stoplight Diet	Tell me how easy it was to use the stoplight guide?	How well did your child understand the stoplight diet? What aspects of the guide would you change?	
iPad	What did you like about the iPad? What things did you have trouble with?	Tell me about any problems you had using lose it or istep log What did you like about the Facetime meetings? How easy or hard was it to take photos with the iPad?	Can you give me some examples? Was time an issue?
Future	Now that you have completed the study how will you use this information in the future?	When you think about prepackaged meals what is the likelihood you will eat them in the future? How would you feel about continuing to track your dietary intake? How would you feel about continuing to track your physical activity?	

Suggestions	What do you feel we can improve?	Would you do this program again?	
Parent Involvement	How involved were you in helping your child follow their diet?	On a scale of 1-5, with 1 being never and 5 being always did you do the following: • Enter food into Lose it • Enter physical activity into Lose it • Enter steps into the ipad Now we are you to switch and talk a little about you. Some parents have told us their own behaviors have change as they helped their child with this program. How did your physical activity level change as a result of your participations in this program? How did your diet change as a result of this program?	

CONVENTIONAL DIET SEMI-STRUCTURED INTERVIEW GUIDE

Topics	Main Question	Follow-up Question	Probes
Diet	What were your favorite things about the diet?	What aspects of the diet were hard to follow? What aspects did you enjoy?	
iPad	What did you like about the iPad? What things did you have trouble with?	Tell me about any problems you had using lose it or istep log. What did you like about the Facetime meetings? How easy or hard was it to take photos with the iPad?	Can you give me some examples?
Future	Now that you have completed the study how will you use this information in the future?	How will you use the lessons you learned about portion sizes? How will you use the information about recommended servings of food groups?	
Suggestions	What do you feel we can improve?	Would you do this program again?	

Parent Involvement	How involved were you in helping your child follow their diet?	On a scale of 1-5, with 1 being never and 5 being always did you do the following: • Enter food into Lose it • Enter physical activity into Lose it • Enter steps into the ipad Now we are you to switch and talk a little about you. Some parents have told us their own behaviors have change as they helped their child with this program. How did your physical activity level change as a result of your participations in this program? How did your diet change as a result of this program?	

APPENDIX C:

DATA COLLECTION FORM

DATA COLLECTION FORM

Participant Name:_____

Date:___/___/___ **Testing Period:** Base 1 Month 2 Month (Circle one)

Tech:_____

Age: ____ D.O.B.:___/___/___

1/8= 0.125 2/8= 0.25

Weight (lbs) 1. _____, 2._____ 3/8= 0.375 4/8= 0.50

2 weights within 0.1 lbs

5/8= 0.625 6/8= 0.75

Height (inches) 1._____2. _____

2 heights to the nearest 1/8th inch (0.125 in). 7/8= 0.875

BMI_____

Waist circumference 1._____ 2. _____

2 measurements within 2 cm to the nearest 0.1 cm

APPENDIX D:

WEEKLY LESSONS

WEEK 1

Portion Sze

Bagels

Let's take a lo k at how portiion sizes ha e changed o er the past 2 ya rs!

20 Years Ago

3 inches Diameter
140 calories

Today

350 Calories

Burgers

20 Years Ago

333 Calories

Today
700 Calories

Tips to Decrease Portion Size

- Choose a kids meal when eating at fast food restaurants
- Read nutrition labels to determine the portion size
- Don't eat out of a bag or box – put the portion you will eat in a bowl
- Use measuring cups and bowls to measure out food
- Cut portions in half and put the rest in a box to take home
- Avoid buffets and all you can eat restaurants
- Use a smaller plate; you can not put as much food on it!
- Choose the smallest drink size and avoid refills
- Split an appetizer or dessert with a friend or family member
- Choose the smallest chip bag over the grab bag

WEEK 2

Physical Activity

Did You Know . . .

- You should do 60 minutes or more of physical activity (PA) on most days of the week.
- PA can be done in small amounts (10 minutes) or longer amounts (60 minutes)
- Physical activity and exercise are needed for good health and weight loss!

GOALS:

1. **Have fun!**
2. **Raise your heart rate**
3. **Be consistent**

Be Consistent— It's the Key!

- Exercise at least 60 minutes
  - 4—6 days per week
- Start slow and increase your activity level
- Start with 10 minutes, then 15, then 20 and so on!
- Find fun activities that make your heart beat faster while you have fun!
- Use your pedometer and record the steps daily

What Should I Wear When Exercising?

Workout Clothes

THINGS TO THINK ABOUT —

1) Go for comfort

2) Consider the season

Clothing suggestions for outdoor exercise:

- Sweatpants & sweatshirts when exercising in the cold
  - Dress in layers so you stay warm – remove a layer if too hot
- Shorts, t-shirts or tank tops when exercising in the heat

Clothing suggestions for indoor exercise:

- Sweatpants & t-shirts when exercising inside when it's cold outside
- Shorts, t-shirts or tank top when exercising inside when it's hot outside

Workout Shoes & Socks

- Wear athletic shoes that fit well
- Shop in the afternoon when your feet are most likely to be swollen
- Consider a cross trainer as they are designed for a variety of activities
- Wear white cotton socks

Walking: Why is it SO Important?

- It is an activity that most people can do
- It burns calories!

Did You Know…

Walking is the best and common form of physical activity, because:

- Walking can help you lose weight
- Walking can help you become physically active
- Walking can make you healthier
- Walking can make you feel happy

How can walking help you lose weight?

Let's take a look and see!

Walking for Weight Control

Walking is an excellent aerobic (fat-burning) activity. Regular aerobic activity will help you control your diabetes and your weight. Plan a daily walk for pleasure and health, but check with your doctor before you start your program.

THE WALKING CALORIES CHART

Food Item	Total Calories	Minutes of Walking to Burn Up Calories (0 15 30 45 60 75 90 105 120 140)
Water	0	
12 oz club soda	1	
1 c lettuce	10	
1 c raw spinach	15	
1 small cucumber	25	
1 c string beans	30	
1 c watermelon	40	
1 c popcorn	40	
½ cantaloupe	50	
1 oatmeal cookie	50	
½ c grapefruit juice	65	
1 slice bread	75	
1 orange	75	
1 c grapes	75	
1 tb peanut butter	95	
1 [illegible]d egg	100	
1 [illegible]dium banana	100	
1 slice American cheese	105	
1 c orange juice	115	
1 c apple juice	115	
1 c cooked peas	115	
1 slice buttered bread	125	
1 c cooked oatmeal	130	
2 oz liverwurst	150	
1 c wild rice	150	
1 c whole milk	160	
1 medium baked potato (plain)	170	
12 oz beer*	180	
½ c raisins	210	
1 slice pizza*	225	
1 c ice cream*	250	
1 slice apple pie*	250	
1 chocolate candy bar*	250	
1 large french fries*	300	
1 medium-size fast-food burger*	360	
2 pieces crispy fried chicken*	500	
1 fast-food fried fish sandwich*	500	
1 slice pie a la mode*	500	
1 extra-thick shake*	700	

*Poor diet choice either because of high sugar, high salt (sodium), high fat, or alcohol content.

A[illegible]d, with permission, from Robert Sweetgall: Walking Wellness, Newark, Del, Creative Walking, Inc, 1987, p 69.

What?
Do other Activities Instead of Eat?
Like What?

Instead of grabbing a bag of chips -
Try one of the following activities!

- Walk the dog
- Go for a walk with a friend
- Dance to your favorite music
- Go mall walking
- Read a book
- Take a bath
- Visit a friend
- Listen to music
- Do exercises when watching TV

Can you think of other ideas?

WEEK 3

Fruits and Vegetables

Today we will be discussing the importance of fruits and vegetables in your diet.

Food for Thought

The National Average Fruit and Vegetable Consumption

Frequency	<1 a day	1 - 2 a day	3 - 4 a day	5+ a day
National Avg.	4.3%	35.5%	36.2%	24.4%

WHY SHOULD WE EAT FRUITS AND VEGETABLES?

- Fruits and vegetables are packed with healthy vitamins, minerals, and fiber
- Eating them reduces the risk of some diseases
- They help with weight management!
  - They are low in calories
  - Eating more fruits and vegetables helps to fill you up so you don't overeat.
- Fruits and vegetables are healthy, give you energy, and easy to eat on the go!

Vegetable Group

Some examples of foods in the vegetable group include:

- Dark green vegetables *(broccoli, greens, spinach, etc)*
- Orange vegetables *(carrots, pumpkin, sweet potato, butternut squash)*
- Starchy vegetables *(corn, peas, lima beans, potatoes)*
- Beans *(black beans, kidney beans, lentils, chickpeas, etc)*
- Other vegetables *(asparagus, cauliflower, cucumbers, tomatoes, zucchini, etc)*

Note

If you are still hungry throughout the day, go ahead and eat even more servings of vegetables!

Different vegetables have different health benefits, so you need to eat many different kinds! Vegetables have little or no fat so if you are hungry, eat as many vegetables as you want, they will fill you up for very few calories!

How many servings per day do you need?

3 Servings!

What counts as a serving?

- 1 cup raw or cooked vegetables or 100% vegetable juice
- 2 cups raw leafy greens

What are your favorite vegetables?

Are there other vegetables you would be willing to try?

Fruit Group

Some examples of foods in the fruit group include:

- Apples
- Bananas
- Berries (strawberries, blueberries, raspberries)
- Grapefruit
- Kiwi
- Melon (cantaloupe, honeydew, watermelon)
- Pineapple

Fruits are good sources of many vitamins but especially vitamins A and C! Any fruit or 100% fruit juice counts as part of the fruit group. Fruits may be fresh, canned, frozen or dried and may be whole, cut-up or pureed.

Fruits are another excellent low calorie option -- so if you are hungry, this is another food group you can feel good about filling up on!

How many servings of fruit do you need each day?

2 Servings!

What counts as a serving of fruit?

- 1 cup fresh, frozen or canned fruit
- 1 medium piece of fruit
- 1 cup fruit juice

What are your favorite fruits?

Are there other fruits you would be willing to try?

Tips to Increase Fruits and Vegetables in Your Diet

Put a big bowl of fresh fruit on the kitchen counter for easy snacking.

- Keep pre-cut fruits and vegetables in the refrigerator - Make the healthy choice the easy choice!
- Try commercial prepackaged salads and vegetable mixes to save preparation time.
- Add fruit to dishes such as mandarin oranges to a tossed salad.
- Try a new preparation method like roasting, grilling, or pureeing.

Other Ideas?

_____

_____

WEEK 4

Rethinking Your Drink!

What do you drink when you are thirsty? If you said water, that's a great option! We need lots of water each day to help our bodies to properly function. Unfortunately, lots of times we grab a different beverage – one that is loaded with sugar and calories!

QUESTION: What are your favorite beverages that you drink?

1.
2.
3.
4.
5.

Not all Drinks are Created Equal!

Check out the chart below on the nutrition of some of the beverages you probably consume.

- Which beverages might be a good option?
- Which beverages do you think you should try to limit?
- Which beverages do you think would be best for helping you manage your weight?

Sugar Sweetened Beverages

Sugary drinks are beverages that have added sweeteners. These drinks usually have lots of sugar added to them and do not provide any nutrition. These include sodas, sports drinks and fruit drinks. It's best to try and limit how often you have these beverages, especially while trying to lose weight.

SOFT DRINKS

If you look at the "Think Your Drink" chart on the first page, what vitamins do you get when you drink soda?

The answer is none! Soda has no nutritional value: it is made up of sugar, carbonated water and flavorings.

Did you know...

A 20-ounce bottle of soda has about 16 teaspoons of sugar and 240 calories?

Tips:

- Have sodas for special occasions only and watch the portion size (8-12 oz)
- Diet sodas have 0 calories, but they also don't provide any nutrients.

A look at Portion Sizes ...

Many soda bottles have more than one serving – so be careful because the calories can really add up!

Check to see how many servings are in the container. If it is more than one, multiply the number of servings by the number of calories to find out how many calories there really are in the container.

Example: 20 oz. bottle soda

NUTRITION FACTS LABEL
Serving Size: 8 fl oz
Servings per container: 2.5
Calories per serving: 100

If you drank the whole bottle:

100 calories x 2.5 servings =

250 calories

SPORTS DRINKS

After you have been physically active, do you reach for a sports drink? Unless you are exercising really hard for an hour or more, this might not be the best option. These drinks have added sugars, which mean added calories.

Tips

- Think about how long you exercised – if it's less than an hour, grab a refreshing glass of water instead and save yourself the calories!
- Watch the portion size – these beverages have fewer calories than many other sweetened beverages, but most containers have 2 -3 servings and the calories can add up!

FRUIT DRINKS

Don't let fruit "drinks" fool you into thinking they are a healthy option! Unlike 100% juice, these juice drinks only have about 10% juice – the rest is sugar!

Tips

- Avoid fruit beverages that say fruit drink, ade, punch or cocktail

Healthier Beverage Options

WATER

Looking to quench your thirst? Try a nice cold glass of water! Water has no calories and it essential for good health!

Tips:

- Try drinking 8 glasses of water each day!
- Don't like plain water? Try a splash of lime or lemon or choose a sparkling flavored water (without sugar)
- Get a refillable water bottle and take it with you each day to stay hydrated.

JUICE

Unlike sugar sweetened beverages like soda, juice does have a much improved nutritional package, but be careful and make sure that it says 100% juice (fruit JUICE). 100% fruit juice is just like it sounds – made from only fruit with no added sugars. As we learned above, fruit DRINKS provide only a small amount of nutrition and a lot of added sugar!

Tips

-Limit your intake of juice to 8 oz or less each day --This will give you the Vitamin C you need for the day – more than this amount will just be extra calories!

-Try using half juice and half water – you'll still get the flavor you like, but half the calories!

Watch your Portion Size!

If you reduce your glass size from 16 oz to 8 oz (or use half juice/half water), you will save ~100 calories!

What a simple change to make!

MILK

Another healthy beverage option is milk. While milk has calories, it is also packed with lots of nutrients that are good for your body! You can decrease the number of calories and fat you drink by choosing skim or 1% milk!

Milk Comparison

Item	Calories	Fat Grams
Whole Milk	150	8
2%	120	5
1%	100	2.5
Skim	90	0

*Amounts for 1 cup of milk

Small Changes = Big Results

Just switching one serving of whole milk to 1% milk each day, you could save 350 calories each week! This one change could help you lose 5 pounds in one year!

Tips

- Choose low-fat milk (skim or 1%) – If you drink whole milk now, try 2% milk. Then once you are used to 2%, try switching to 1% or skim.
- If you like 2% milk, try skim extra (tastes like 2% milk, but less calories!)
- If you don't like plain milk, add just a touch of flavoring like chocolate or strawberry

Let's Re-think what you Drink!

Let's look at the calories and sugar in an 8 ounce glass of the beverages we have talked about.

Drink	Calories	Sugar
Water	0	0 teaspoons
Crystal Light	5	0 teaspoons
Low-fat Milk (skim, 1%)	100	2 ½ teaspoons
100% Orange Juice	110	5 teaspoons
Juice Drink (10% fruit juice)	150	9 teaspoons *
Powdered drink mix (sugar added)	80	5 teaspoons *
Sports Drink	60	3 teaspoons *
Soda	100	6 ½ teaspoons *
Diet Soda	0	0 teaspoons

**the sugar in these beverages is added sugar (not natural sugar like in fruit juice or milk)*

I will drink MORE:

_____

_____

_____

I will drink LESS:

_____

_____

_____

Let's Get Physically Active!

Benefits of Physical Activity

- Increases your strength
- Helps you lose weight
- Helps you to move around easier
- Improves your balance
- Improves energy levels
- Helps you sleep better
- Helps you be more flexible
- Helps you feel happier, less depressed and stressed out
- Helps you feel better about yourself

So what are physical activities?

See the pyramid on the next page for examples of things physically active people do.

Physical Activity Pyramid

Did You Know...
There are many different types of things that count as physical activity?

What's Keeping YOU from Reaching your Physical Activity and Exercise Goals?

1. What is stopping you from being physically active?

2. What can you do to make it easier to be physically active?

WEEK 6

Eating Out

Today we will talk about how it is still possible to make healthy choices even when you are eating on the go. Let's start by taking a look at the types of foods you usually pick when you eat out.

When you eat out, what foods do you usually order?

Do you think these are healthy choices? If not, what foods do you think you should eat less of when eating out?

Why Eating Out Can be Difficult

Eating out can be a challenge sometimes. Why? Because when others prepare our food, we do not have as much control over how our food is prepared or how much food is served. Many times we think we are picking a healthy option but may not be aware that higher calorie items have been added. We also tend to eat larger portions when we eat out.

For example - here is a common meal you might get when eating at a fast food restaurant:

Most individuals need around 2000 calories each day -- those that are trying to lose weight, need even fewer calories each day.

A meal like this may have **1320 calories** and **51 grams of fat**

The problem: That doesn't leave many calories for the rest of the day and you likely won't stay full for long!

- Check to see if there is Nutrition Information available -- many restaurants have this information available online or in the restaurant
- If the restaurant serves bread or chips before the meal, try to limit how much you eat

Healthier Bites

Here are some ideas for healthier food items at different types of restaurants:

Chinese Food

Instead of	Try
Egg Drop Soup	Wonton or Hot & Sour Soup
Egg rolls, Fried Wontons or Crab Ragoon	Steamed Dumplings
Fried Entrees (example: General Tso's Chicken, Sweet & Sour Chicken, etc)	Broiled, boiled, steamed or little stir-fried entrees
Fried Rice	Steamed Rice
Lobster, oyster, bean or soy sauce	Sweet & Sour sauce, plum or duck sauce

Mexican Food

Instead of	Try
Four tortillas (contain lard)	Corn tortillas (made with less fat)
Carnitas (fried beef or pork) or chorizo (sausage)	Grilled fish or chicken breast
Refried Beans	Black beans, borracho beans or Spanish rice
Guacamole or chili con queso	Salsa
Sour cream or cheese	Salsa, pico de gallo, cilantro
Quesadillas	Chicken fajitas (skip the guacamole and sour cream
Flautas, Chalupas, Tacos	Chicken or beef enchiladas with red sauce or salsa

Italian Food

Instead of	Try
Fried Calamari	Dinner salad or minestrone soup
Cheese or meat-filled pastas or casserole type dishes (including Alfredo)	Pasta Primavera or pasta with white or red clam sauce
Pasta with butter or cream sauces	Pasta with marsala or marinara sauce
Scaloppini or Parmigianino dishes	Marsala or piccatta dishes
Italian pastries such as cream cake	Italian ices

Cajun Food

Instead of	Try
Fried crawfish or shrimp	Broiled or grilled crawfish or shrimp
Gumbo, etouffe and sauces made with roux	Creole and jambalaya dishes
Fried seafood	Broiled or Grilled seafood
Fried shrimp or Po'Boy sandwiches	Turkey or roast beef Po'Boy sandwiches
Dirty rice (contains chicken, gizzards, livers, butter, etc)	White Rice
Red beans and rice with sausage	Red beans and rice WITHOUT sausage

Adapted from American Heart Association; http://www.americanheart.org/presenter.jhtml?identifer=1104

Fast Food CAN be Lower in Fat

The following fast food contain from 0 to 16 grams of fat per serving. Most fast food contains 20-60 grams of fat!

Food Item	Fat (g)	Calories
McDonald's		
Cheeseburger	12	300
Hamburger	9	250
McChicken	16	360
McVeggie Burger	8	350
Chicken Fajita Sandwich	8	220
Grilled Chicken Classic Sand	10	420
Grilled Chicken Snack Wrap with honey mustard	9	260
Chicken McNuggets, 6 piece	15	250
Fruit & Walnut Salad, snack size	8	210
Apple Dippers, with dip	0.5	100
Asian Grilled Chicken Salad with Sesame Ginger Dressing	12.5	390
Bacon Ranch Grilled Chicken Salad, no dressing	9	260
Fruit & yogurt parfait, with granola	2	160
Vanilla Ice cream Cone	3.5	150

Food Item	Fat (g)	Calories
Subway –Lunch		
Ham or Roast Beef	5	290
Oven Roasted Chicken Breast	5	330
Subway Club	6	320
Sweet Onion Chicken Teriyaki	5	370
Turkey Breast	4.5	280
Turkey Breast and Ham	5	290
Veggie Delite	3	230
Turkey Breast Wrap	6	190

What Changes Can You Make?

Think about one or two of your favorite places to eat - can you come up with a healthier meal you might enjoy in the future? Here is one example:

What you Order Now	Healthier Option
Example: Wendy's Bacon Deluxe Single Medium French Fries Medium Coke **Calories: 1250 Fat: 55 g**	 Jr. Hamburger Mandarin Oranges Garden Side Salad with Light Ranch & Croutons Medium Diet Coke **Calories: 470 Fat: 15 g**

Now you try...

Location: _____

What you Order Now	Healthier Option

Location: _____

What you Order Now	Healthier Option

WEEK 7

Healthy Snacking

Many people think that snacking is bad, but if you make good choices, snacking can help you get the nutrition you need. Snacking can even help you control your weight. When you don't eat for a long time and get really hungry, you will likely eat a lot more at your next meal. Picking a healthy snack in between meals can help you not be as hungry and help you not overeat at mealtime.

What are some of your favorite snacks?

Do you think these are healthy snack options?

Snack Makeover

Let's look at some common snacks and think of other snacks that might be healthier.

Instead of this Snack:	Try:
 Cookies	 Fruit
 Chips	 Popcorn (no butter)
 Ice cream	 Pudding

Let's go back to the snacks you said you like to eat.

Are there any changes you can make so they are healthier?

When you pick your snack, try picking one food out of 2 or 3 food groups.

Vegetables	Fruits	Grains	Dairy	Protein/ Meats
Carrots	Apples	Cereal (non-sugary)	Cheese	Lean Meats
Cucumbers	Oranges	Crackers	Milk	Tuna
Bell peppers	Bananas	Pretzels	Yogurt	
Cauliflower	Strawberries	Bread	Cottage Cheese	
Snap peas	Grapes	Popcorn	Pudding	

Example:

Low-fat string cheese
Whole grain crackers

Cereal (non-sugary)
Low-fat Milk
½ Banana

Yogurt
Fresh fruit

What are some healthy snack combinations you would like to try?

Snacking Tips

1. If you want a snack, ask yourself if you are hungry. If you aren't hungry, find something fun to do instead of eating!
2. A good rule of thumb is to eat snacks that are 100-200 calories each.
3. Don't eat from a box or bag – put the amount you plan to eat in a container so that you know how much you eat.
4. Have your snack at the table rather than eating in front of the TV or computer – you will eat less!
5. If you will be on the go during the day, plan ahead and pack a healthy snack.

Can you think of other ideas?

WEEK 8

Social Situations

What is a Social Situation?

Some examples of social situations include:

- Going out to dinner
- Parties
- Special Olympic events
- Family events
- Sporting events

Social situations can sometimes be difficult when you are watching your weight because these events are often centered around eating. In these situations, you may be tempted to pick foods you wouldn't normally eat or eat larger amounts.

Do you have any social situations coming up?

Do you know what type of foods/beverages will be there?

Making a Plan

Sometimes it is helpful to have a plan in place before you go to the party/event so that you make good decisions. If you wait until you are already at the event, you may have too much on your mind to figure out a good plan or the food may look really good and you may be tempted to forget about eating healthfully that day.

Let's look at some strategies you might use to help you keep on track with eating healthy when you are at social situations.

Helpful Hints for Eating Healthy in Social Situations

1. Eat before you go so you are not hungry
2. Avoid salads with heavy dressing or potato salads
3. Only drink water or other non-sweetened beverages
4. Take everything you want to eat and cut it in half
5. Say no to leftovers
6. Bring items you know are healthy, like a fruit or vegetable tray
7. Fill half of the plate with vegetables
8. Eat smaller meals the rest of the day, but do not skip a meal
9. Try to only have 1 dessert
10. Don't hang around the food table, get some food then go someplace where you cannot see the food
11. Use a smaller plate
12. For less healthy items – prioritize what you really want. Pick one or two things you would really enjoy (limit portion size) and round out your plate with other healthy foods.

Can you think of other strategies?

Let's Make a Plan …

Upcoming Social Situation: _____

I will use the following strategies to help me eating healthfully:

1.

2.

3.

APPENDIX E:

ENHANCED STOP LIGHT DIET GUIDES

KU diet and exercise at-a-glance sheet for:

_____

at least **3** servings of vegetables

at least **2** servings of fruits

3 shakes

2 Frozen entrées

*If still hungry, they can have more vegetables and fruits.

=exercise

Examples of exercise:
10 minutes on elliptical
20 minutes on treadmill

Exercise goal is _____

Step goal is _____

If they are away from home and are not able to eat something on the list above, please see the color-coded "Stoplight Food Ratings" chart to help them choose mostly "green" items and avoid "red" items.

STOP LIGHT FOOD RATINGS

- LOW CALORIE – *EAT PLENTY OF THESE!*
- SOMEWHAT MORE CALORIES – *GO EASY ON THESE!*
- EVEN MORE CALORIES – *LIMIT & AVOID EATING THESE!*

VEGETABLES:

- ASPARAGUS
- BEANS: GREEN & YELLOW
- BEETS
- BROCCOLI
- CABBAGE
- CARROTS
- CAULIFLOWER
- CELERY
- CUCUMBER
- LETTUCE
- MUSHROOMS
- ONIONS
- PEAS
- PEPPERS
- SPINACH
- SQUASH
- TOMATOES
- ZUCCHINI

- BEANS (WHITE, GARBANZO, BLACK)
- CORN
- LENTILS
- POTATOES (BAKED/MASHED)
- SWEET POTATOES (BAKED/MASHED)

- POTATOES (FRIED)
- SWEET POTATOES (FRIED)

FRUIT:

- APPLES
- APRICOTS
- BLUEBERRIES
- BLACKBERRIES
- CANTALOUPE
- CHERRIES
- GRAPEFRUIT
- GRAPES
- HONEYDEW MELON
- KIWI
- MANGO
- NECTARINES
- ORANGES
- PEACHES
- PEARS
- PINEAPPLE
- PLUMS
- POMEGRANATES
- RASPBERRIES
- STRAWBERRIES
- TANGERINES
- WATERMELON

- BANANAS
- CANNED FRUIT
- DRIED FRUIT

MEAT & EGGS:

- CHICKEN (GRILLED/BAKED, NO SKIN)
- CRAB or BAKED FISH (NO BREADING)
- DELI MEAT
- EGGS
- SHRIMP (GRILLED/BAKED, NO BREADING)
- TURKEY (GRILLED/BAKED, NO SKIN)

- BACON
- BEEF
- BRATWURST
- CANADIAN BACON/HAM
- CHICKEN (WITH SKIN/BREADING)
- CHILI
- FISH (WITH BREADING)
- HOT DOG
- PORK
- SAUSAGE

- SHRIMP (FRIED/BREADED)
- TURKEY (WITH SKIN/BREADING)

DAIRY:

- CHEESE (FAT FREE/LOW FAT)
- COTTAGE CHEESE (LOW FAT)
- CREAM CHEESE (FAT FREE)
- MILK (SKIM/SOY)
- SOUR CREAM (FAT FREE)
- YOGURT (FAT FREE)

- CHEESE (REGULAR)
- COTTAGE CHEESE (REGULAR)
- CREAM CHEESE (LOW FAT/REGULAR)
- MILK (2% OR WHOLE)
- SOUR CREAM (LOW FAT/REGULAR)
- YOGURT (REDUCED FAT/REGULAR)

GRAINS:

- BREAD (LOAF, SLICE)
- BUNS
- COLD CEREAL (NON SUGARY):
  - CHEERIOS
  - CORN FLAKES
- CRACKERS
- CREAM OF WHEAT
- HARD TACO SHELLS

- BAGELS
- BREADSTICKS

- COLD CEREAL (SUGARY):
  - APPLE JACKS
  - FROSTED MINI WHEATS
  - GRAPE NUTS
  - HONEY NUT CHEERIOS
  - LUCKY CHARMS
- CORNBREAD
- DOUGHNUTS
- MUFFINS
- OATMEAL
- PANCAKES
- PASTRIES
- PASTA NOODLES
- PIZZA (ALL KINDS)
- RICE
- ROLLS & BISCUITS
- TORTILLAS
- WAFFLES

SNACKS & DESSERTS:

- JELL-O (SUGAR FREE)
- POPCORN (FAT FREE)
- POPSICLES (SUGAR FREE)
- PUDDING (SUGAR/FAT FREE)

- JELL-O (REGULAR)
- POPCORN (LOW FAT)
- POPSICLES (REGULAR)
- PRETZELS

- BROWNIES
- CAKE
- CANDY (HARD, GUMMY, CHOCOLATE)
- CHIPS
- COOKIES
- CUPCAKES
- FROZEN YOGURT
- FRUIT SNACKS
- GRANOLA BARS
- ICE CREAM
- PIE
- POPCORN (REGULAR/MOVIE THEATER)
- PUDDING (REGULAR)

OTHER:

- MARGARINE (FAT FREE/LOW FAT)
- MAYONNAISE (FAT FREE/LOW FAT)
- SALAD DRESSING (FAT FREE/LOW FAT)
- SALSA
- KETCHUP
- MUSTARD

- BUTTER
- GRAVY
- MARGARINE (REGULAR)
- MAYONNAISE (REGULAR)
- OIL (VEGETABLE, OLIVE, CORN, ETC.)
- PEANUT BUTTTER
- SALAD DRESSING (REGULAR)

BEVERAGES:

- COFFEE (PLAIN/WITH SUGAR FREE CREAMER/NON-SUGAR SWEETENER)
- CRYSTAL LIGHT MIXES
- SODA/SPORTS DRINK (DIET)
- TEA (UNSWEETENED)
- WATER (PLAIN/FLAVORED)

- COFFEE (WITH SUGAR/CREAM)

- FRUIT JUICE
- HOT CHOCOLATE
- LEMONADE (REGULAR)
- SODA/SPORTS DRINK (REGULAR)
- TEA (SWEETENED)

How to make a shake!

1. Pour cold water into blender.
2. Add shake mix with flavorings and/or fruit.
3. Turn blender on to lowest speed.
4. Blend for about 10 seconds.
5. Gradually add ice cubes 1 at a time (replace blender cover after adding each ice cube).
6. Continue mixing on lowest speed for 1 ½ minutes until ice is thoroughly blended and shake is smooth.

Options:

- To make your shake extra filling, mix on high speed an additional 10 seconds.
- If you don't have a blender available, pour 8 ounces of very cold water into a tall glass. Add 1 packet of shake mix and mix thoroughly with spoon, fork, or whisk.

APPENDIX F:

CONVENTIONAL DIET FORMS

KU diet and exercise at-a-glance sheet for: _____


=vegetables

Examples of 1 serving of vegetables:
1/2 cup cooked/raw vegetables
2 cups leafy greens

at least **5** servings of vegetables


=fruit

Examples of 1 serving of fruit:
1/2 cup fresh/canned/frozen fruit
1 medium piece of fruit

at least **3** servings of fruit

*If still hungry, they can have more vegetables and fruits.


=dairy

Examples of 1 serving of dairy:
1 cup of milk or yogurt
1 1/2 ounces of cheese

3 servings of dairy


= meat & poultry

Examples of 1 serving of meat:
1 piece of chicken, fish, or steak as big as a deck of cards

2 servings of meat


=whole grains

Examples of 1 serving of grains:
1 slice of bread
1 cup of dry cereal (non-sweetened)
1/2 cup cooked rice, pasta, or cereal

6 servings of whole grains


=exercise

Examples of exercise:
10 minutes on elliptical
20 minutes on treadmill

Exercise goal is _____

Step goal is _____

Sample day for _____

Breakfast	Snack	Lunch	Snack	Dinner	Snack

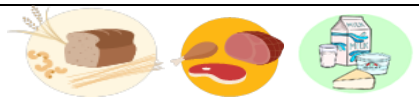
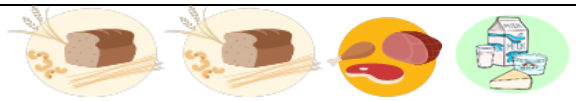
Fast Food Guide

McDonalds

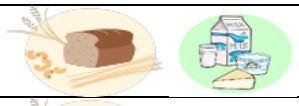
Hamburger	
Cheeseburger	
Filet-O-Fish	
Grilled Chicken Sandwich	
Grilled BBQ Snack Wrap	
Grilled Honey Mustard Snack Wrap	
Grilled Ranch Snack Wrap	
Apple Slices	
Fruit and Yogurt Parfait	
McChicken Mini Meal with Apples	

Taco Bell

Fresco Chicken Burrito	
Fresco Steak Burrito	
Fresco Chicken Soft Taco	
Fresco Soft Taco	

Crunchy Taco	
Chicken Gordita	
Cheese Roll-Up	

CiCi's Pizza

Cheese Pizza (1 slice)	
Alfredo Pizza (1 slice)	
Ham & Pineapple Pizza (1 slice)	
Zesty Veggie Pizza (1 slice)	
Ole' Pizza (1 slice)	
Garlic Bread (1 piece)	

Subway

6" Ham (No cheese)	
6" Oven Roasted Chicken	
6" Turkey Breast (No cheese)	
6" Veggie Delite	

PORTION GUIDE

VEGETABLES

Raw or cooked vegetables	1/2 cup	
Leafy greens	2 cups	
Baked potato	1 medium potato (5 inches long)	

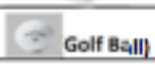
FRUITS

Whole fruit	1 medium piece	
Sliced or Small fruit	1 cup	

DAIRY

Cheese	1 slice or 1/4 cup shredded	
Milk	1 cup	
Yogurt	6 oz or 1 small container	
Frozen yogurt or icecream	1/2 cup	

MEAT & PROTEIN

Meat (beef, chicken, fish)	3 oz	
Peanut butter	2 Tablespoons	 Golf Ball)

GRAINS

Dry Cereal	1 cup	
Pancake = CD	One 4 inch circle	
Rice, pasta, or cereal	1/2 cup cooked	
Bread	1 medium slice	

APPENDIX G:

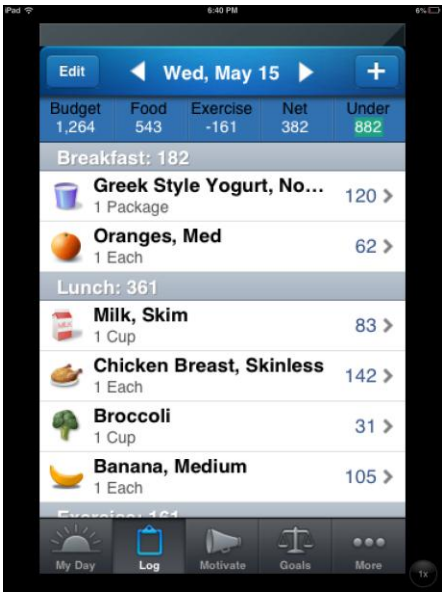
APPLICATION SCREEN CAPTURES

Lose it! App for diet tracking.

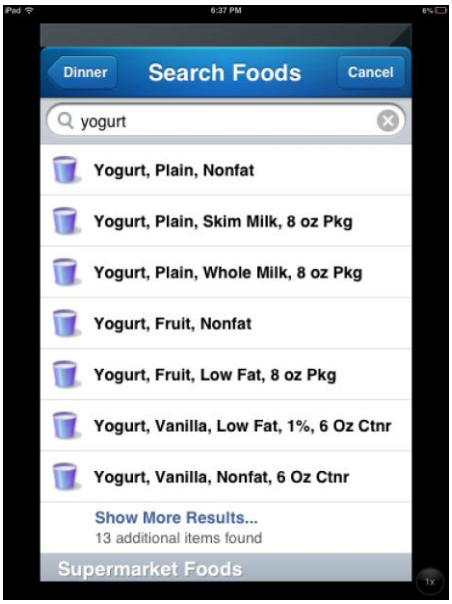
Four figures:

F1. Shows tracking of meals throughout the day
F2. Shows food search
F3. Shows food being entered.
F4. Shows running daily calorie total and calorie budget.

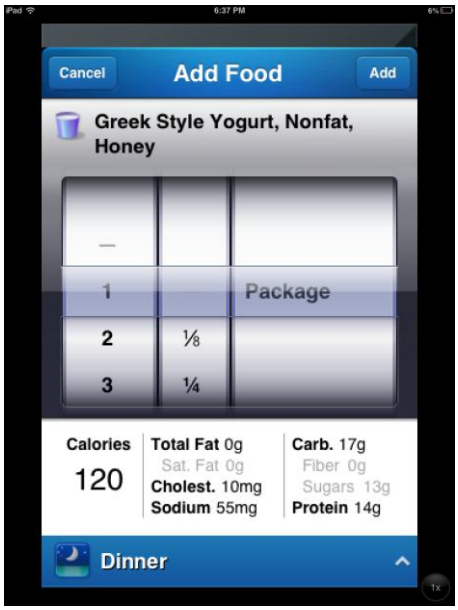
F1



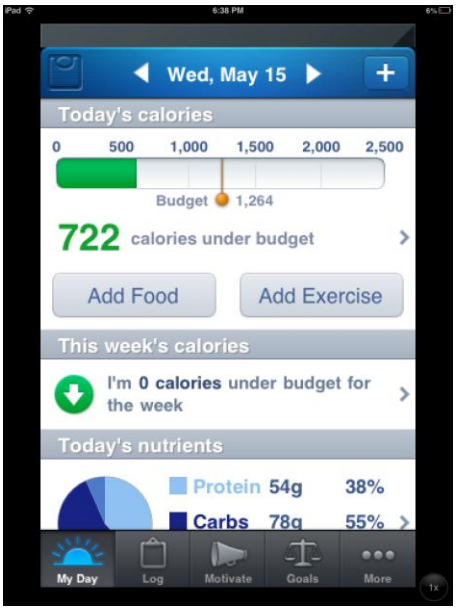
F2



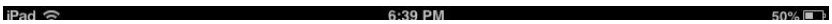
F3



F4



Fitbit app for Step Tracking



APPENDIX H:

EXAMPLE IMAGES FROM THE PHOTO-ASSISTED RECORD


KRAFT
RASPBERRY
VINAIGRETTE
LITE
ANYTHING

APPENDIX I:

RESULTS FROM PARENT INTERVIEWS

CONVENTIONAL DIET GROUP

Diet

What were your favorite things about the program?

- Well, I think just eating what we normally eat; but just thinking about portion control…and also if we had something that maybe wasn't quite as healthy, the fact that she could exercise and, um, make healthier choices during the day, so …that you know… "*Easy"*…writing it down…using the iPad…was good.
- I think mine was just the beginni… still the first day when you were showing the portions and um (pause) … just showing us how much people should be eating and.. Yeah… and well watching her pay attention to things and…Not think it's just her mom that's sending her out to exercise
- Um, helping him learn portion control and forcing him to try new fruits and vegetables
- I think the best thing about the diet was just… it made me a little bit more accountable. So I had to be a little bit more thoughtful.
- Um, I liked that he was paying more attention to the amounts that he was eating and made him more aware of how many calories and how much he was taking in; and then to see him decide either to go ahead and eat what he wanted to eat and choose to walk on the treadmill or to maybe go… "No, I don't need to eat that"… and… So that he wouldn't have to walk on the treadmill
- I liked how it had the kids, they had to stay within certain calories and they were to do it right and subtract it out and it was real easy so the Lose It app was real easy for them to use
- Nick really enjoyed playing on the ipad. I really enjoyed him learning about portion size. I think portion size was the most important thing here because he eats big food, like grizzle bear sized portions, and he thought that was ok to do. Doing this program he really learned what a portion size was and saw that he needed to cut back.
- I think it was pretty effective. I think it was … at least it was helpful for me to really … we try to focus on serving size and him scanning it and seeing that I think was … the visual part of it I think was really good. I think for him he probably could have had a few … a little bit less calories, but I don't know how that works nutritionally or whatever, but yeah, I think it was easy to use and that was pretty … it was kind of a learning experience. I thought it was pretty good. I think coming out once a month was good especially if it's long term. I think that would be good. The incentive, I think the money it's good for him. It's not his biggest incentive. It's difficult to find an incentive for him. He already has the iPad so that for him … but the other, at the

same time we go to bookstores and stuff. He was very excited that he was able to … I don't see, he doesn't even remember.

- I loved everything. And I told everyone that I could possibly tell. It was so educational for both of us, and she - it just worked for her. And obviously, you can tell by the weight loss. She's just made really good healthy choices. So anyway, yeah, she just did great. The school was very instrumental in documenting her food. When she didn't, just, I of course - I would pack her lunch, and we would make choices together. And then, the school would say, "Oh, she ate the entire thing". Or half the thing. So we were able to be real specific in cups and portion size. And I've even noticed she's branched out, which is shocking, to just getting a bowl of dry Cheerios for her morning. Because she has a real grazing issue. So. That's been good. You've been diversifying what you like to eat.

<u>What aspects of the program were hard to follow?</u>

- Nothing really.
- The exercise, it was the best and the worst part, Cause for a long time she did not want to do it still.
- Uh, trying… trying to limit his dairy product intake. Because his favorite beverage is milk, pretty much….. It actually has gotten easier….yeah. It was kind of a struggle the first half… Yeah, he used to be more fussy if we told him "No, he can't have any more milk" , but now he's just like, "oh, ok…."
- I found it tedious….Um, and some things were very difficult…So sometimes I avoided…they were a couple times when I had planned a certain meal in my head and I thought "I don't want to sit there and list all those ingredients… I'll do something else", but other than that, I can't add anything more. Yes, I felt that it… sometimes it was difficult to think of other things that I could make that were low calorie… That were also easy to write down. And so I found that I was thinking about both things: both low calorie but also how easy is it going to be for me to write it all down and to keep track of it. And food now…and I don't buy a lot of the processed foods…like the sauces and that sort of thing, but it's not easy to get pure foods…And sometimes you know there are approximations. It's not exactly what I had, and so sometimes things that I had I'm sure were higher calorie than what I actually gave her… and sometimes it's the other way around… so I'm like "Well, it kind of evens out…" (*laughs)* I think coming up with meal ideas that were low-calorie was hard, so I tried to keep it to something like a piece of meat and vegetables; and I'm sure there's more creative ways of doing it? Also it was hard because I am not sure what foods the school is giving her. And I am sure that they just let her have what she wants. And I give her a certain amount; and even at home I'll say "That's it." I don't leave the tomato sauce on the table. I give her a certain

amount and tell her "that's it." When it's gone, it's gone. And she told me she got more. And it's all those little things that they probably aren't thinking about…But for Ali with her metabolism… it's a big deal…And one day they decided on a moment's notice…. because the class had done really well so they took them out to McDonald's and got them a breakfast burrito. She'd already had breakfast. She had packed lunch. And then she had a breakfast burrito. I mean something like that… that's it. That's the day gone. We're over now; and I can't withhold for her dinner. And so the teacher said to me: "Well, do you want me to keep her back then when the kids go out?" Well no, I don't want to do that. So I said "No, that's fine if you go out; but could you just make sure she has something low-calorie". And it wouldn't hurt for the other kids too. None of them are starving. Something yogurt. They don't need a breakfast burrito: 460 calories. And that's, I think, what's killed us too. And so there are days…. I found it a little bit frustrating because I'm trying to follow the diet; I'm trying to keep to that calorie limit and then she gets a breakfast burrito or she gets a couple chocolate chip cookies; and then I can't give her anything

- No, I thought it was really easy for him to follow since we weren't really asking him to eat anything that he didn't like to eat or didn't want to eat; or you know, we weren't trying to introduce new foods … just a different way of eating
- Making sure that they were eating their five grains and two fruits and two vegetables and trying to do that and the calories at the same time was tough. Yes and I don't know if it would be easier to just have to have way to do it one the lose it...you sent me a thing where we could mark off fruits and all that but it just got too much to do both at the same time. I think if they were able to hit I ate a fruit, I ate a bread or when I sit down for my meal, okay I have this and I have that. I don't know then if that would stay within their calories so I didn't know what the focus was.
- At first it was hard for him to remember to eat fruits and vegetables. It was just a change. I think having you send him daily reminders made that easier though. Entering things into the iPad was not hard per say but I knew Nick felt like it was a hassle to remember to do everyday. He did it, but I know that sometimes he did not really want to.
- Just some times he just didn't really care to be honest with you. I had to just hold him to task. He would be like oh I don't care if I eat a gallon of ice cream. Just trying to have him really learn and understand that these choices we're making we're trying to get him to eat healthy and stuff. I don't think I could just let him loose and he would continue to follow it on his own and stuff like that. Like with a lot of things for him and maybe other kids like him, it takes a long time to really affect a change.
- What he is he internalizes it or generalizes it, but I think it's been a great start. I think we plan to try to stick with at least looking at serving sizes and have you had this and limit the amounts. Also trying to increase his fruits and vegetable. Again he

doesn't have a big variety of foods he likes to eat, but we've been trying to just keep the things on hand that he will eat.

What aspects did you enjoy?

- Someone forcing her to exercise and having her be able to track what she was eating on the ipad.
- I think helping him learn… you know, what kind of things he should eat and what food groups he should eat; and how much of them are better for him.. But, um….by having to actually look at how much he's getting, I think that helped him.
- It was just accountability of writing down everything that I had and seeing the calories in everything. Because that was one of the things that surprised me actually is how many calories are in some of the things. You know, even the cereals; and even though I don't get the sugary cereals. Even just a Mini-Wheats. So, um…and then I would give her eggs sometimes and that has a lot of calories in it
- It was pretty easy for him to think about weather he wanted to not eat or go to walk on the treadmill… and this diet better than one where I would have said you can only have lettuce and carrots and celery… and I know; that's why I thought this was a good diet for him to try… because it didn't ask him to eat vegetables. Well, I mean it kind of did. It made him want to think about it; but if hr didn't like them….
- The liked the Lose It They were happy with doing that because if they wanted a splurge day we'd go okay you at least have two or three fruits and vegetables and then you can have your cookie. It worked. The fit bit was awesome because they liked to see how many steps they took and trying to figure out what days got more steps and why they got more steps than other days was interesting. Yeah, so the fit bit. They have A days and B days at school so it would be whatever days they had different schedules would have more steps than others. They didn't wear the fit bit to PE so PE wasn't a part of it. It was how many times do I have to go up and down and what classes so that was interesting because it was significant, a couple thousand.
- He loved to have the ipad. He would take it everywhere with him, it was such a good motivator. I think he enjoyed losing weight but really the ipad was the best part of the study for him.
- I liked how it created the bank of food, especially for somebody like Michael. He doesn't eat a huge variety of food. I think the fact that when he was in the green and if it went too red, if he went over, he was very cognizant of that. I think the visual aspect of it I liked for him. Even if I went through it, I think it was good. Then we like the Fitbit Michael kept. He would look and see where he was. He'd see if he had the flower on. I thought that was pretty good. Again a lot of the visual cues for him I think helped him see what he was … just to see what progress he was making. I just think that the technology aspect of it makes it so much more easy and I think people

will stick with it probably way longer than if they have to write it. Well you saw my writing, whereas if I do it on the iPad, I'll put it like Brussels sprouts and I'll put olive oil fourth of a teaspoon or whatever is the smallest amount because it's a mix step over the whole tray, stuff like that. I just think it's so much easier to be accurate I guess on there.

- Ok, it was the iPad

What type of physical activity was done?

- She liked to dance and would do her dance videos on the TV. And you know she walks the dogs every morning and evening around the block so that really helped.
- Well it took a month to get her to do anything and then she was just talking, but in the last week she has really started to run so that is good.
- Just whatever is done in gym class, we just don't have time for more than that.
- Mostly just the Wii She does the sports and then she's got the dance…and she likes both, oh and dance she loves her dance classes.
- He would get on the treadmill, that is the only activity he really wanted to do. Well other than the bowling he does at school.
- Wresting was his main activity. He was practices three to four times a week and meets on the weekends. However, now that that is over we are trying to find some things for him to do. He does weight training at school but I am hoping to try to get him to do some cardio work. Like use a treadmill or something. He doesn't seem open to the idea as he thinks they are boring, but I am hoping to find a way.
- Well in P.E they do quite a variety, which is good. He did the elliptical a little bit. They've been doing badminton. They just kind of rotate, pickle ball, things like that. I think they just get him moving. He does walk a lot at school. He does a lot of … he does like jogs or whatever, so he does walk a lot. Just trying to keep him moving is a challenge I think for us and always will be whether we're tracking it or not. In the summer he does swim more. We usually do lessons and then we try to go into the pool and stuff like that. He'll start up again. There is going to be Special Olympics. We'll have tennis that will start in March. I think there's also swimming. Unfortunately they're at the same time and two nights in a row. I don't know if they're both going to fit in our schedule, but we'll definitely do one of them.
- You do dance, but what - when we went to the gym, what did you do? Went on the treadmill. We tried to go (to the gym) once a weekend, every Saturday. But she - every opportunity that she could - could go run and get the mail or, you know, walk the dog around the cul-de-sac, we tried to do. I ordered a treadmill and a elliptical that should've been here by now, so she can go downstairs and put on her favorite movie. And we don't have to hike it over to the club and do all that. And that way if she wants, you know, if she wants some computer time, I can say, "That's fine, but you need to have 15 minutes on the treadmill." So it's not here yet, but it's coming.

Ipad

What did you like about the iPad?

- Oh, that it was just "touch"…"this and that"…and that it recorded previous meals eaten…that made it easy…Uh, that you could do the "scan the bar code"…that was very easy. It didn't work on *all*-- on every bar code- but that was okay. It worked on enough of them. Um, and then…that it built a list of foods and portion sizes that she ate a lot… so that you were just picking those off of that list. That made it real easy.
- Well the games And I thought it was kind of cool that I like… put down the food I ate and the exercise I did… and got to see how much calories she had gained…at the end of the day.
- Well, Sam loved all of it. I have an old, old original one which is really pokey slow now; but he liked…he liked the games on there. He really…actually, one of his favorite ones now is that Food Group one. I thought the apps were pretty user-friendly; and I like how the, uh…how the "Lose It" keeps your… keeps the data you put in it, so it's easier to find things again.
- Yeah. It was easy. It was straightforward. It was no problem. It was just tedious. But it would have been tedious using the ipad or writing it down.
- He would say the games. I like that it was easy for him to use and it… he was the one that was doing it, and not me, and it was easy & fun for him to do that
- It was a great teaching tool, absolutely, and just the ease of finding the app and the app had all the information that they needed and they could click on fit bit and Lose It and it had all the information they needed right there.
- It made him want to do the program. He loved the iPad and right away it was his main reason for signing up, besides the fact we wanted him to. He would take it everywhere and I think because he had it with him it helped him to remember to do everything he was supposed to do.
- Well, I liked that it was so portable. We took it with us even when we went out to eat. A lot of times we were able to just enter things in right there. He uses it a lot, so it's just so handy. It's not like if we had a separate book or something separate we'd have to do it with. He has … as a kid with an iPad, he wants it with him all the time. I think it's just very … makes it just really acceptable. It fits his lifestyle.
- I know you liked it, but was it - was it hard or was it easy? Easy. That made it - that was easy because you could just come home from school, and you would do - punch your little loseIt! button and search for foods and put it in there. Very user-friendly.

What things did you and your child have trouble with?

- Nothing
- No troubles

- Nothing
- Nothing
- Nothing it was pretty easy. I guess we did have trouble with the wifi freezing that first night, but once Grant moved downstairs it was fine. So it was just a wifi thing. So I mean… I think as long as the participants have a good Wi-Fii signal, it would be ok…
- Other than breaking the screen on Mallory's ipad! (laughs). It was just a bad cover on it and I was the one that knocked it off the table not her, so it really was my fault.
- Nothing was hard to do on the ipad, just remember to do it was the thing he struggled with the most.
- I don't think so. I really don't think so. The struggles that I have with Michael I would have whether he was on the diet. Just trying to get him to increase his activity level, constantly trying to find sports or anything that he likes. So far swimming is about the only thing he really likes to do. That doesn't always work out in the winter and everything.

<u>Tell me about any problems you and your child had using lose it or istep log.</u>

- I think it was just a matter of remembering to put it in. Sometimes we would not put the information in the same day. So it was just a matter of remembering…or if we put it down on a piece of paper; remembering to put it in there. So that was more "us" than the application. No problem with the application. I think we, um, …once we got the right password and everything, then we were good on that.
- iStep would never work so we just wrote the steps down
- None, it was simple
- It was simple just tedious
- Nothing really. Just that one…that first night we tried to video chat and the lose it was not connected, but you told us what to do and it worked fine after that.
- No just the syncing with the fit bit since it didn't work for those 10 days before you came to fix it. Oh and Ryan had a hard time trying to find some of his activities like time on the Wii or...I'm trying to think what we had to...it was hard to log a bike ride. Is it a stationary bike or bike ride outside. You can't really log your miles per hour so those were a little bit harder. When we went to the trampoline place, how do you log that? I know at the beginning it was hard at least for lunch time trying to guess what foods in the Lose It. You helped us categorize if I have a turkey sub that it more fits probably in the Subway because there are so many and it would be helpful if the school would publish what it is so a lot of times with Mallory we ate manicotti and you'd see either I'd have her enter the recipe in or we'd try to range it because one manicotti might be 800 or 200 so let's try to hit middle of the road.

- No real problems. Towards the end he had trouble syncing the fitbit with his computer, it would have helped to sync with the ipad instead, but I know you all didn't get the newest version. He still wore it but sometimes we were not sure if the data transferred to you.
- No, I don't think so. … I don't know, it just … it would be nice if they were somehow connected so that you didn't have to enter the … you could see if they somehow were interfacing with each other, but I don't know if that's possible, if there is something else. You've probably thought of that. I think that would be good because then he … not that it was a pain to put the exercise on there, but especially for example for P.E at school. I don't really know how hard is he doing it or how … he can't … he says, "Oh I did it for five minutes or whatever." I'm not sure the school … they write it down, but I just don't know how much they're going to exactly put down to the minute every activity he has. I know he's in there for 45 minutes and I don't really know what percentage is devoted to what. I think heaping them together would be great. Then you could really see, maybe it wouldn't show the activity, but you know at least hey, he's done a lot of steps this day or P.E had a lot … I think that would be nice.
- The belt thing because it frustrated me not to be able to get to get it going everyday. Not the belt - the step thing (the fit bit). It just stopped working or I couldn't calibrate it correctly. I tried and tried and tried and tried, but - so maybe the information's in there. I don't know.
- She had trouble spelling it, it's not very user-friendly with the spelling and we could not get the barcode scanner to work. Once she got good about, you know - you can't, like, you can put in Weight Watchers, and then it gives you 363 choices.

<u>What did you like about the Facetime meetings?</u>

- Oh, I thought those were good. Yeah, I think Paige really enjoyed those. It was convenient, very convenient…to do it that way.
- Well we could not get to the Internet with my leg so you know we had to call you, but I think that was helpful. Emily was always excited to tell you about her progress, I think it would have been better if we could have used the facetime so you could have seen her data, but it still worked out well.
- Yeah…. It helped him, they were not very long so it was not inconvenient
- I think it's useful.
- Well, you know, the first one I made him sit out here …And he…(*starts to whisper)*.."It was really cute; he was fixing his hair" (*laughs)*. He really seemed to like them. He says he learned to stop overeating and to drink his special juice…you know the V8 we have him drink to get vegetables in.
- I think they looked forward to them. I liked that it helped me hold the kids accountable for what they were doing so I could still hear you guys set your goals

and then I'd try to reinforce the goals even though I wasn't on there. That's what I liked. It's highly convenient I think for everybody because then we can do it first thing in the morning or late at night or you're not tied to the schedule.

- I think they were good. Nick is old enough to be in charge of his own diet so we didn't sit over his shoulder and make sure he was doing them, we figured if there was a problem you would let us know. Overall, I think they helped him remember do to the program and knowing that you would be looking at what he was entering made him remember to eat the right things and to enter them into his ipad.
- I don't know how much he got out of that to be honest with you. Michael, he doesn't know how to use the phone. He doesn't like talking to people about himself. That's one of his issues. That's a goal that he has on his IP, just to talk about himself. For him I don't know. I don't know if he would do that long term. He might get used to it. I don't really know. I try to give him privacy thinking that would get him to talk more, but it probably didn't. I'm not sure he really understood why he was doing that.
- Oh, I liked it. If nothing else, because I know she didn't have a lot of questions, it kept her remembering that she was doing this program. Because your face became synonymous with this thing that we were attempting to do.

<u>How easy or hard was it for your child take photos with the iPad?</u>

- Easy…she did that all on her own
- Easy has a problem once where she accidently deleted a photo but taking them was easy
- Easy, he really liked doing that.
- It was hard to remember to take them but easy to actually do.
- Very easy. It's a little harder because I kept making them keep the case on and you'd have to take a couple extra. I think reminding because they might eat a little bit so I'd have to get it back out and let's take a picture again. I think they remember if you do it more often. The hardest part was just remembering to take the pictures
- It was easy, he always had it with him.
- I think it's pretty easy. In the beginning when you had us take, he was doing it better than me. He knows how to do it.
- Easy.

Future

<u>How will you use the lessons you learned about portion sizes?</u>

- Well again…portion control and I think it is very helpful to write things down because you don't realize that you've maybe had eaten out more than you thought

you had…or that you haven't introduced any new vegetables in a while (laughs). So I think just the portion control and meal planning…yeah.

- I'm a lot more conscious of portions going on plates and getting daily exercise
- Well, if I can get Dad to get on the program, we're going to keep trying to do the same thing. We're going to limit the pop we drink. Which, he's done pretty good. He knows that he should not drink regular pop very often. I think that has helped a lot; and then we need to try fruits and veggies. Are we still going to eat peaches in our lunch? You like those, don't ya? Yeah, cause I don't want him to be a little chunker like … like some people are. Umm … with a lot of people, yeah…and unfortunately I think "more so"… I think the kids that are 'not'…. don't have a weight problem. I think most of them, it's because their genetics are pretty … (*laughs...* I mean they have pretty good…. because most of the kids that go to his team group….um, they all have Down Syndrome; and most of them are a little bit overweight. Not; I mean some of them 'not'; but some of them are "very" overweight… but most of them are a little overweight. And all the ones that come into my pharmacy…. I think everybody but "him" are. In fact, there's one little girl who's younger than Sam. She's 12, maybe 13 now… and she's on high cholesterol medication… and she's on a diabetes medication already. Yeah; and one of his best friends is pretty pudgy. But he eats salads! He drowns them in salad dressing.
- I think keeping track of it is… is really the only way of making sure that you're staying in that schedule. Because there were times when I thought I was doing really well and then I went and put it in and thought 'oh no'. You know, we're close to going over…we've gone slightly over…so with that said… there are some of the meals that she has a lot. There are certain breakfast and lunches that she likes and she'll ask for again and again; and I know exactly how much I can put in now. So those I wouldn't… I don't feel I would need to do anymore. Serving size was useful, I think you know if I do put some seasoning in…. I'll just put a tablespoon in and normally it's actually for the three of us. So I'm putting it down on hers as one tablespoon because I don't know how much she's getting in hers…but really she's just getting a 1/3 of that tablespoon. So probably only about a teaspoon of margarine. But I'm careful about how much I'm putting in. I'm not just taking a dollop out and putting it in. I'm putting in a tablespoon.
- Well, I know he was telling me a little bit ago that he will try to eat less and if he eats "more", especially when he's working at McDonalds, he's going to try to work out. I was hoping he would be interested in, um, like on my iPod that I might give him… hecould have the Lose It! Program or the have the program that I use and continue to keep track of what I eat so he would know where he's at each day, but we are still talking about that. He says he is tired of tracking. Overall, with this information we learned I think it gives us a reference point to remind him, or to say…"You know, well you had a cheeseburger and fries at lunch; do you need to have a cheeseburger

and fries again at supper, or could we maybe…so it'll… so now that he has that visual and that experience, we can just reference it

- We are going to...I'm going to set them up with the Lose It and we're going to keep doing it. We won't have an Ipad so we'll have to try to figure it out on the computer and do it that way which will be different for them. I'm curious how easy it will be for them because I think they'll have to both sign in at different times so it will be interesting. Also portion size was important. I think for them to see eating a cup of cereal as opposed to a bowl of cereal was different and Ryan just used to use milk to wet his cereal where now he's drinking his milk. I think we'll carry that forever. Just keep up with eating less food and eating more of the right types of foods. We are really going to be working hard to get him to do more aerobic training so he can get some exercise in since wrestling is over. If he keeps up the good work we may get him an ipad and get that app that he has been using so he will keep doing it. Like I said portion size was the big thing. I think he will use this information for the rest of his life. He now knows that he can't have 6 cups of milk at dinner time or have a whole pound of ground beef with his dinner. I think he knows what a portion is and how to cut back and my hope is that he will continue to do just that. This had made him much more aware of what's in everything and what are good and bad choices to make. I think, like I said we're going to continue looking at serving sizes. We may just go ahead and continue with Lose It just so … because sometimes I might be surprised oh, he's way under today and I'm surprised. Or wow look … so I think we might just keep up. Maybe not every single day, but I think I'll at least pick some days where hey let's go ahead and use it and see where we are, because I'd like for him to continue slimming down a little bit. I know he's going to go through puberty, but I don't think he's going to be real tall. I just want him to be healthy. I think this is a good tool for us to use to try to get him there. What we've been doing is, we've just been going by it, like okay what's the portion size of something, like for dinner? It will be whatever. If it's three [tequidos] where he might have gotten sick, we just say here is three. He doesn't argue with it and really we're going to … and I think just showing him, "Oh look, see it says three here." I think that that will help him. Really again it's the visual for him. Then we'll just … like at that other time I just said, "Well here, have this apple if you're still hungry. He hasn't really complained too much. Then as far as things go, that's where I think it probably makes the biggest difference because if he does have ice cream or whatever we're just going to stay, reduce the portion and that's it. I think if there's a snack he wants then he really wants it. For him I think a lot of it is his metabolism to be honest with you. I just think that he, overall … like a lot of his snacks are beans, but if there was cake for example, he would eat a whole cake, or he would eat a whole gallon of ice cream. We just don't have it all that often. I think at school I think I've helped them become aware. That's probably been a learning curve for them. I think because it's been an

ongoing issue we've had for a couple of years with them. I think they finally … it made them sit up and take notice. Like oh, we've got this … it's something that somebody else is looking at this. Not that they didn't listen to us, but I think it was just easy for them to just say, "Oh well, let's let them have it, let them have it." I think at special occasions, I think that's when he could get into trouble. Sometimes there's a lot of them. if you have use of a lot …. You think oh, it's only a birthday. Well, when you have X number of birthdays in a family, an extended family in a month. I think just special occasions we need to just really watch it and treat it like it's another day. You can have a little extra, but not … just don't use that stuff as an excuse I guess. Going out to eat, we've actually gone out less I think because so many places we go are so high in calories and we realize wow. We went to Five Guys last weekend I think the first time because it was just unbelievably … we just never noticed. We never bothered looking at the nutrition until we got the tab. I think trying to make better choices about going out is probably going to be a big thing, because that's probably where he consumes a lot of these excess calories would be burgers, fries, pizza and all that. We were probably going out maybe two, three days a week. I'm sure we cut out at least one of the days. We probably go out maybe once or twice now. We usually go out on the weekend and maybe once during the week. It used to be sometimes like well it's just … so we just … we didn't even really discuss it to be honest with you. We just one of those things I was like oh, well that place is like … so we say well, let's just take what we could come up with at home. Usually if we don't go out unless he … or to get an ice cream sundae that we'd make at home, he would never go over his calories. I don't know if it's just the way the [inaudible 00:12:24]. It's not conscious. It's just what we have is just not nearly … even if we have a frozen pizza, it's still not like those huge pizzas you get at a restaurant kind of thing.

- Like I said this was the big thing. I think he will use this information for the rest of his life. He now knows that he can't have 6 cups of milk at dinner time or have a whole pound of ground beef with his dinner. I think he knows what a portion is and how to cut back and my hope is that he will continue to do just that. This had made him much more aware of what's in everything and what are good and bad choices to make.
- We're gonna continue it, right? Pack your lunches, cut your noodles in half... Taking her lunch every single day. Finding the Smart Ones so she could have a hot lunch. And I'd nuke it in the morning and wrap it in foil so she'd have - and she was able to choose which one she wanted. That kind of thing. And then choose your drink and choose your... You usually chose a fruit.

<u>How will you use the information about recommended servings of food groups?</u>

- Yeah, we used a smaller bowel for treats and things like that. That seems to go good, right?
- We already got a variety so that was not very hard and we didn't learn much from that. I mean for breakfast we always have like dairy and cereal…. and for lunch we always have some kind of fruit or something like that with it … and then for dinner we usually have meat and a vegetable at least.
- Yeah, I mean I pretty know…. I know pretty well what a portion size is; but I think that helps "him". And we have certain plates he eats out of which really helps because it's hard to tell what a portion size is when you just have one big plate. He likes to eat out of those little ones that are like the picnic plates that are segmented… so pretty much a normal portion size fits in one of those little segments. He does tend to like to overeat on his meat choices. He's a like a "meatsy" guy… (laughs) So we have to watch that, but…When he can eat more, more fruits and different vegetables… that will give him a wider variety of things that he can eat or that he would like to eat; & it keeps him from eating… making other choices that may not be as good.
- We were already doing a lot of that cause she's a big salad eater. So pretty much every day I think she's close, but I have been conscious about putting another piece of fruit in her lunch. But she's a pretty good eater. So I think we're… I think we're pretty close to hitting the five portions of fruit and vegetables
- I think he will use it. I know he wants to go back to eating bigger stuff. You know he was having a double quarter pounder everyday and now he is having a regular hamburger, but he wants to go back to having more. But he says he wants to have less than he was as he knows that was too much, more like a McDouble. He is trying to convince me that they patties are smaller and closer to the food model you showed us.
- Yeah we absolutely want to try because I don't think there was ever a day we hit the recommended, ever. We tried. . I think Mallory struggles with fruit and Ryan struggles with vegetables. I don't think either of them struggle with grain. I have always tried to get them to eat a protein at every meal and then Ryan does over on the cheese so trying to cut him back on dairy a little bit so just trying to get that balance.
- He knows he has to eat less carbohydrates, he can't just snack on bread anymore. He is learning to eat more fruit and vegetables in place of his high sugar snacks and we are hoping he is going to just keep doing that.
- We're trying to … still that's kind of a challenge. Still trying to get him to increase his fruits and vegetables and probably yeah … just more like the snacking of fruits and vegetables I think because sitting down in a meal … he just has, he just doesn't like to. Well, I'm not going to eat an apple and a meal. To him that's just weird or

whatever. Sometimes I just try to sneak in and just give it. Here, why don't you have this as a snack? I wouldn't say he has a huge, huge appetite because of his medication it keeps his appetite in check. If it wasn't for that, oh my gosh, he would be huge. There's no doubt about that. Just trying to again keep those portions down and try to get it a little more balanced, which is probably one of the bigger challenges we've always had with him, is to get a variety of foods. He probably likes vegetables more than fruits. It's usually … he likes crunchy, he doesn't like bananas for example, but again when we have smoothies, he'll have everything in the smoothie. As the weather gets warmer I'll make more of those. Often times I'll make them, just in the morning he could have it instead of milk or with his milk or whatever. That's a good way to get the fruits and vegies in his is just to throw carrots in something or whatever, because he's decided now he's not crazy about carrots which he does like. It's just sometimes there's no rhyme or reason to his logic. He doesn't really have any. He just arbitrarily says, oh I don't like that anymore. Anyway, probably the fruits and vegetables, increasing those will be an ongoing issue.

- Do you remember how big a portion that she taught you? Right when we started doing this program, how big would - how big could your meat be? Do you remember? Your fist or a deck of cards? We're going to keep doing that. And eating more vegetables. We really did that. I had chopped up vegetables for her, on a plate, for the family, all the time.

Suggestions

<u>What do you feel we can improve?</u>

- Uh…I don't know if 'you all' can improve anything. It just took us a little while to get in the mode of remembering. Um, and I know you had tools that had like reminders on the Ipad & everything. Maybe if we would have used those more. Um, but…yeah, I think that was the thing. Um, and I would say more times than not, "I" ended up entering the information on there. Paige, sometimes she would sit right there next to me…but about half the time, or at least half the time she didn't want to do it.
- The only thing I can think of is… maybe check like the…and, and we could have done it at home too… but maybe check… like the waist and the weight more often… You know, not like all the time, but maybe more often… cause I wonder… you know, if we would have checked it and I can't even remember when we did check it. Like, if we would have checked it after two weeks…you know, cause teenagers you don't want to check it too often either or they're going to start worrying about it… but like every two weeks or something… or even three… that maybe should would have realized she… she wasn't getting somewhere and maybe would have started the

exercise that she's doing 'now' a little earlier. I don't think it would matter if you gave out scales, but just…just 'knowing' … even if, even if you… and I'm not just speaking…I'm just thinking of the big picture of other families too… who may not…do it… have…you know, because we do have a good scale, but some may not… But even if you would just say 'Ok, I want a weight in three weeks … you know, even if you just would have told us…… after two or three week 'we want a weight and we want a…you know… a waist size. I mean, I don't know how you could do it because I know it has to be standard but…That might be an extra visit for 'you' if you had to do it and people didn't have it but… I just think, you know, after week 2 or 3 it… it would be have been nice to have that also.

- Um, I don't know… my husband thought that his calorie limit was too restrictive, but I didn't think it was at all because we didn't really have to cut back very much. Like I don't think we really cut back at all… other than on some of the dairy because he probably drank way too much milk anyway for a normal person; which he always has. I mean he wasn't a real huge… he doesn't snack. Like he's not a kid that you have to bolt the pantry or the fridge cause he just would never… If he's hungry, he tells you he's hungry and that means he's starving. So he's not a big snacker; but um… I don't know… I really I liked it. I mean, I thought it was easy… to follow… I don't really think it was any different. I mean, other than portion control and trying to drink new things and not drinking so much pop; I mean I thought it was real easy to do
- Get into the schools and…(makes a grumbling noise with her fist)…Rrrrrr. You know, I think they need to buy into it too. That would make the big difference; and I even offered to send in snacks… but then the other kids are having cookie or a brownie… you know, they're doing cooking activities and making these things… and she's having celery. That's no fair either.
- No, it's great how it is.
- I think trying and maybe it's a test group of seeing if there's an app with kids and focus only on getting all of these components in or and a group do the calorie ones. Yeah I think which is the more beneficial way to do it. Should I focus on getting good food or not so many calories? I know you have that test group that eats food you provide so that would be interesting to do. I think having that third group, which is the best way to do it? Boxed food, food groups, or calories?
- Nothing really, it was very well structured. However, there can always be improvements…um…um…I guess the only thing is that having the home visits and the facetime at home was a problem for him, he is easily distracted when at home and it is hard to hold his attention. If we would have been out of the house he may have listened more. However, Nicky can drive himself while I know a lot of these kids can't so that probably would not work for everyone.

- I don't know. I think for Michael is just a matter of making it long enough that these habits will become, these changes will become habit. That's probably the biggest thing that it just needs to be continued. It needs to be ongoing. it needs to be probably a few months or so. For him to really … even for any of us I think, even for our family habits I think … I hope we plan to keep a lot of some of the changes we've made. Not going out to eat so much or trying to just increase our fruits and vegetables, to keep those going. I just think for Michael, just having something … just have to do it longer, probably even two months. I think it's a study two months for a change. The way he eats and his activity level is probably not enough. I guess making it longer would be a suggestion. I don't know, I guess if it's a year and a half, 12 months what might be good, again if a lot of the kids are visual is to maybe do a chat of the weight or something like that just as a … so that they could … he could see his progress maybe and see … there might be something. Yeah. I think that for a lot of kids that are visual that might be … over time they could see oh look at that. I started out weight this how because for him to go oh look how, for swimming doing it was good. I'm not sure that's going to do it. Although he did say a couple of weeks ago, he goes, "I'm getting skinnier, aren't I?" He noticed. I guess it's probably in his belt and guessing since his pants I've had to tighten them a little bit. I don't know if he was proud of it, but definitely he's noticing that his body is changing which I think is great. Of course we don't want to say, "Oh you're really overweight." We don't ever say that to him, but we just talk about if we swim, then we're healthier, we get a little bit stronger, we grow taller and with strong muscles and stuff. He's … I'm hoping that what he sees about this is becoming healthier. That's our goal. Yeah. I think it's been a pretty good experience and we'd love to. If you do end up continuing we'd like to be considered to be included.
- I thought it was fantastic.

<u>Would you do this program again?</u>

- Yes, I think so
- Yes, he didn't realize it was any different for him besides not being able to have the pop and milk so it was easy and we would do it again.
- Yes I think so
- Yes, I would. Definitely.
- I would have him do it again
- In a heartbeat, I don't think 60 days was long enough for them to make a habit so I want them to do it again.
- Yes, it has helped him immensely.
- Yeah, definitely.
- Absolutely.

Parent Involvement

How did your physical activity level change as a result of your participations in this program?

- I wouldn't say that's changed because Alli plays her Wii while I am doing the dishes so I don't do it with her.
- Um, I don't think so because I was already tracking and exercising. Um, and so… it maybe made me more aware of what he was eating; and perhaps I didn't buy certain things during this time so he wouldn't have that option.
- I think it leveled it out where I've been trying with my fitness pal and going to the gym and then they didn't want to do anything so I think it helped get them a little bit more motivated so that we do it as a family and not I go do something and my husband goes and does something. I think maybe it's increased it a little bit because I'm doing it with them and I'm doing my own.
- Not really, we are already pretty active so it was more of trying to get Nick to do things with us.
- Like this in the winter, probably not. We are more … we get out more in the summer than we do in the winter, so that didn't really increase that much.
- I work out all the time anyway, but with - it forced me - some things I thought for sure they were less calories than what they really were. And that was - I'm usually a good one about reading it, but since Lent started, I'm doing 40 days of exercising, so that's what I added.

How did your diet change as a result of this program?

- Yeah it changed, cause I'm eating pretty much what she's eating. So what I pack for her lunch I pack for my lunch. Um, you know we eat the same dinner. Um, our breakfast is different, But apart from that we eat pretty much the same thing so…portion sizes, yes.
- That didn't change as I am already pretty active. It was fun because his dad and I track our steps daily already so with Grant doing it we could all compare.
- I'd say no because I think it's maybe portion control where we're a lot more focused on how much does everybody's meat weigh and how many vegetables do we have and how many servings. I'll say yes in that respect, more portion.
- No we ate the same things, I think Nick just learned how much of the food to take and how to make better choices when we were not around to make meals for him.
- Yeah, again I think we aren't going out to eat as much. We're just really looking at portion sizes and trying to make sure we try to get more fruits and vegetables. I think everything that we're trying to get for Michael, it's not like he was eating

separate food from us. What he was doing, we were doing. By him making better choices and us making better choices for him we were doing the same. I think it's definitely been beneficial for probably all of us, the whole family.

- Well, I just - we just - overall, I tried to - anything she was gonna have, we all had it. That kind of thing. And just, you know, trying to be - when we went out to eat, just talking about, "Ok, if you're gonna have a pancake..." What'd you have when we went out to breakfast the other day, a chocolate chip pancake? Lots of vegetables. Lots of - very little red meat.

eSLD GROUP

Prepackaged Meals

Tell me about your experience with the pre-packaged meals?

- Well I said, "we" liked them….it's at least easy anyways….I mean he'll pretty much eat anything, although he showed a preference for some (you know) over the others…. but he did…. I said (for me) it was easy for me too… (ya know)… not having to measure things (you know) and I don't have time for that. He liked…well like I said it was easy…he liked the ones that would kind of mimic what… (ya know)…what Noah or some of them… (ya know, the other family members)…. were eating. So like, we had Mexican food….*um*…like we had taco salad or something… I could…I could like cut up the beef enchilada or something and put it on lettuce…. and it would look a lot the same (*ya know?*)….so he liked things like that. He liked….he liked the Mushroom?…The Mushroom Rrrr….something? I can't remember how you said that; but he liked that too. We got a lot of help this time from the grandparents…they were…they were on board with it, and wrote down what he ate and stuff for me and… but the most out of control I felt was when at school…because…. Just whatever they were serving…..and I know that he's always encouraged to eat healthy but I could never keep track of what he had exactly.
- She really liked the shakes, I think those were her favorite. It was a great way to get her fruit in for the day. She love to have them for breakfast and would ask for them a lot. She thinks they tasted really good.
- I liked them, they… they really helped, especially at lunch time…. And, it really helps me because you know how busy we are… it just helps; it helps Sidney and it helps us not to have to worry, um, about what she's going to eat. And like… because if any other given day she would just go in the refrigerator and get like whatever was there… that she saw…. that she liked, or whatever, in undisclosed amounts. And that was the hardest thing… it was like how much did you eat? You know, not knowing that… because she would just… you know, she's old enough to go into the refrigerator and get what she wants; so being able to say, you know… it's just easy for her. She's like "oh wow"… pop 'em in the oven… I mean pop it in the microwave for a minute, and she's set. And a lot of times when I got home; because her dad would be here when she gets out of school, she'd… I'm like: "Did she eat yet?" …. "Yeah, she ate" (Dad)… She's like "Yeah, I already ate!" And it was just really nice to know. She would warm them up at school. Her teacher would go to the teacher's… it's right, in the lunchroom area they have their own little microwave, so they'd microwave it for her. It only took a minute, which was really handy, because most frozen meals are what… like four or five minutes

- He just got tired of them. At first they were great. They were very convenient for me but he got tired of them. At first he liked the HMR ones yeah but he's not really crazy, after a week he would not eat them. Then I started cooking them and then I started cooking everything and you suggested buying frozen ones and I started doing that and that makes life a lot easier. He loves the frozen ones they got pizza and spaghetti and lasagna, his kind of stuff. They were great because they looked healthy.
- They weren't so tasty, but I liked the shakes except I didn't really like the vanilla one. We went to the store and got Smart Ones or either we made our own food.
- For me, I think that they were tasty for Patrick because he likes to eat them. Now we have to be careful because he will go and get him another one and another one. The shakes didn't work for us for breakfast. Had they had the breakfast entrees … I don't know if that's something that they're working on. That probably would've helped too. He just ate lunch out because it was … I think it would've been more helpful had he had more than just dinner.
- It was very easy . My only problem was that they weren't that tasty. I doctored them up a little so that helped. A little pepper. Some of them I had to put hot sauce on. The chicken I put barbeque sauce on. Now the turkey with the beans, those beans were hard as rocks. I could've thrown them and knocked some window panes out with them. Other than that, most of them were good. I didn't like that one. I wasn't crazy about the lasagna. The rest of them were pretty good. Breakfast was hard too because when I say that's breakfast when I give him the shake, he gives me attitude. We started using the shakes for snacks only because he couldn't use them for breakfast. He just could not understand that.
- Now we purchased packaged meals. I think we were able to try a lot of … with the different meals to just expand the diet choice. We tried a lot of different things. We tried the Chinese ones. We tried the fish. We tried the pasta. We tried Alfredo, the macaroni. There wasn't any of the meals that he didn't like that we tried. We tried each variety. Shakes were good and in fact I was pleasantly surprised when I joined him in taking the shakes because I wanted to have a feel for what they tasted like. That they were pretty good and he even asked to make sure that we made his shakes every night.
- I think that worked out really well. Yeah, you liked them (towards participant), didn't you? She took them - more days than not - to school. Didn't eat them at home, but used them for 3 days a week when she eats - when she takes her lunch. So, more times than not, that's what she took, and that was fine. And then she added a piece of fruit or some carrots or something to that, and that worked out great. . For breakfast, she would have that shake every single morning. Now she's out of the chocolate - and do you like the vanilla as well? (she says no) But maybe if you added

a little chocolate syrup to it? You could make it chocolate. Yeah, then you could make it chocolate. And when we were at the Downs Syndrome clinic yesterday, they talked about her needing a multi-vitamin, so we got that, grind it, and then put that in with her daily shake.

What did you most like about the meals?

- Just that it was easy and he could still choose. It's something he can fix himself and something that's easy to keep track of. It just helps so much with portion control.
- They were simple and tasted good and we knew she was getting the right about of food for that meal. They would also really help to fill her up.
- She could make them by herself and that made her feel more independent too. Like she more was in control; and she knew that, you know… she started to notice that she was losing weight. So, it's very convenient
- They had everything in them. Low cal and perfect. Then I could add vegetables which I like to do and I could just send them to school. Which was great because that was his biggest meal. So he would just eat those instead of buying his lunch I'd rather him eat healthy than...and right now his age he needs to start making directed choices I guess, start to curb his wants into what he needs instead.
- I liked the idea of the meals but just not the taste of the meals. They are really helpful to...I don't know if I'm supposed to but just to have it so you already know the calorie count and it has the nutrition that you want and stuff but the taste of those was just not good, not something that you could do on a continuing basis. If you really are somebody who...
- For me, we had more on weekends. I tried to stick to it more on weekends. During the week it was just for dinner. I like the convenience of it because then you can take it places. It was just ready.
- He would have the meals for dinner. Then lunch was whatever the boys had while they were out on the program. But they were great especially when you're really hungry. It's fast. I like that fact that the calories were already on there. You're counting your calories for the day. It was just there. The information was there.
- That's a good way for us to work on portion control. It's also a good way to work on skill building because what we started working on doing is having Austin look at the directions and prepare the meals. Some of the prepackaged meals, you poke holes at the top. Some of them you had to lift the film. The main thing for us is portion control. Added benefit is the independent preparing various meals.
- That it was portion controlled. And that it was so easy: she could do it herself. There was lots of success with that, and an easy way to. (asking about bringing them to

school) Yeah, that wasn't a problem at all. There were a lot of kids who bring food from home and microwave.

Tell about times when your child did not eat the meals?

- Usually the only times he didn't eat them is if we were out to eat (ya know where he ate….) or if he was at school …. like eating a school lunch…. and um …I said.. or I said there were a couple times where, ya know, we'd eat over at Grandma's house or something like that…um, he spends the night a lot over at his m….or… my mom's house & Gerald's mom's house…& if he was over for the whole day, they would bring one for lunch or for dinner, ya know? Because they kind of have, ya know, like traditions where they'd go and eat…but they would always make sure…like if they got pizza, they would get the healthy ones with the thin crust and not with all the meat & stuff on it.. so..
- She has been good about getting out the measuring cups and trying to measure out her food or look at the side of the box then figure out what color food it was and if she could eat it. Um… It would either be; like sometimes like after the game or sometimes on the weekend, um, I would let her, you know, eat a normal meal… I would say; or close to normal… like with modifications. So like if we were eating Chinese food… instead of giving her the one with the… all of the sauce & all of the salty stuff or whatever; I'd get her like with light sauce, or like the clear sauce, or with the brothy sauce. And do her with more vegetables… so as opposed to getting her like Lo-Mein noodles, I'd get her (you know) like beef or broccoli… or chick…not beef and broccoli, but like chicken and broccoli. And I would tell them, you know, give me extra broccoli or add some; can you add some extra carrots or like mixed vegetables? So when she did eat; she was eating really kind of mostly vegetables and then some meat in there; or I'd compensate because we'd have like brown rice… like instant brown rice; and I'd you know switch it out for the white rice… or the…cause it wasn't too hard cause my husband eats healthy anyway… so that was…. You know, it was just trying to increase the… well you know, monitor the fat content…and the… you know, the carbs. : Mm-hmm. Or I would sometimes what I would do is let her have like a little bit of treat with her meal; so she'd have like… she'd eat her, you know, whatever meal and then she'd get like… but see, it would kind of help me out because I would control that 250… 200-250 calories and then she'd have like… if she wanted nachos or something, I could easily… or she'd have like one taco as opposed to eating like, you know, 5 or 6 like we were doing; she'd eat like one taco and then have her meal. And then she'd eat like… for dessert, she still had her ice cream; but her ice cream would be like a fudge bar… but the fudge bar would be what like… 60 calories or a 100 calorie fudge bar… as opposed to like, you know, real ice cream… like 3 - 400 calorie regular ice cream.

- I cooked. I always cook healthy. We have a lot of fish. We have a lot of chicken. Chicken and a vegetable or fish and a vegetable. We did that for a long time when he first started. That's what...I've got like tonight we're going to have...I got some collard greens and I like to put those with potatoes and I've got some ham but it's lean ham. I like a lot of vegetables.
- We went to the store and got Smart Ones or either we made our own food.
- He would have the meals for dinner. Then lunch was whatever the boys had while they were out on the program. Because with them being at school all day; it's really not school, the 18-21 program. It seems like they were doing something different every day in the community. There was no way we could monitor lunch. They got what they wanted. Terrence more or less ate what he wanted, but she wouldn't let him super size it or anything. She tried to discourage him from ordering sodas and order water. So not only was she trying to help him health wise but even economically, because she was telling him "Oh Terrence, don't spend $2.50 on a Coke. You can get water for free."
- Actually, for me, because the teacher sends home every day what he eats because she knew we were on this. She geared him towards eating more salads and stuff like that; salads and he didn't eat dessert. Then, we tried to keep it where he didn't eat too many calories for breakfast; a couple eggs and a couple strips of bacon. We tried to make sure he had a fruit every breakfast and a vegetable every dinner. Now if we would've gotten on that other program with the fruits and the vegetables, I think that would've helped too. But, even though we didn't get on the program, I tried to buy more vegetables and more fruit so that he could just have two vegetables at lunch or dinner or whenever he's at home.
- It depends. Regardless of what setting Austin was in we encouraged the healthy eating. The red foods, green foods, yellow foods was helpful because when he was with his grandmother she could say to him, "Austin, that's a red food," to manage that system. We've been practicing healthy eating for a while so we try to do that at home and it works better if we keep extra stuff out of the house. Austin is a sneaky teenagers so he's learned how to get what he wants as opposed to asking for permission. When he's with other family members, they may not practice those healthy eating as well. That's a challenge especially when someone who picks him up for an after school therapy session. We try to continue to make sure that anybody that he's with outside of my setting is also trying to [inaudible 00:03:28]. Then we had our Friday free nights. Friday free night was breakfast which we went from all fried to steam and blackened and French fries, that's all.
- We would make sure that there was a lean protein and then a fruit and a vegetable. And, again, working on portion control. We would use some of our measuring cups to make sure that that was a half a cup or that was a cup. So that... Evenings, you

know, probably the biggest downfall - if there is a downfall for her - it would be snacks. It's hard to... And her tendency to use, like, a 90 calorie brownie as a snack versus a, you know, fruit with peanut butter. Because she doesn't like peanut butter, you know? So that was a little - fruit with some cheese, you know? Just snack choices. Yeah. Yeah. Because all of the - every meal at home that she eats. For breakfast, she would have that shake every single morning.

Exercise

Can you tell me about the exercise your child did?

- Caleb helps manage the football team so those practices and he would lift weights with the other players.
- She mainly played the Wii or we would go to the rec center on the weekends.
- She has cheering a few times a week and has been playing the Wii. She is in shape. Let me tell you; because I tried to do that "Wii". "Black-eyed Pea… one of the dances? " Is one of… their dances are real like… you're jumping up, you're getting on the ground, you're getting up… you're hopping down… you're kicking it. "I" was wore out; but "she"… she can do… she can literally do it for hours. I mean, hard dancing… like hard intense dancing… so I can tell that she has really good stamina; because before she'd be like "Whoa, after like ten or fifteen minutes… she's done". She'll do the Wii… usually when she has something 'really good.' Like when she…if she…If I say "ok"… you know; she's having one of those weak moments, or we're somewhere when everyone's eating deliciousness. She likes to dance. Dancing and music…that's how she. Yeah; she learned how to talk and everything pretty much. So dancing, music, and visual. I mean… I can't…she can; if I don't stop her, she'll go for hours. So I have to tell her: You have to stop and drink water. Like you have to… so yeah, she doesn't mind exercise
- She has actually started taking him to the Y in the evening. They did a water aerobics class Monday night. Tuesday night they did kickboxing and then I don't know what Friday is but she's taking him for all that great stuff and then me and him, we go and he likes to play racquetball and basketball and kick the ball up against the wall with me and then we do some of the machines too. He's getting some activity.
- At points in time she would want to exercise but sometimes she just really didn't want to. When she did she'd go on Just Dance or took a walk or go up and down the stairs 10 times. If we have the TV on I try and get her to move around while she watched
- He walks when he's at my house. Usually when they go out in the community they walk. He has misplaced the thing (pedometer). He misplaced it just in the last few

days. I haven't seen it in about three or four days. Okay. Anyway, no … It's hard for me because I work evenings. Even though I'm off on Saturday, we don't belong to the gym or anything; it's gotten too cold to go outside. We didn't do much. We didn't do much exercise though.

- Patrick does the treadmill now. We do it every day. I do get Terrance when Terrance is over there. He walks for a little bit on it. We have Wii's but don't use them much. The Wii, they see that as playing. It's just something. I think when you're having to get dressed and go somewhere then it's built in your schedule. I think probably having some kind of log for people to actually sign in that they're exercising. I found that you can put it in the Ipad. I started doing some of that. I think making it mandatory where you log what you do for exercise that day and make you even more aware you need to go out and move.
- Exercise and physical activity generally tends to be a lot of the same thing, walking, walking around a track as well as the treadmill. Basketball, swimming, we've got weights and so we do probably five minutes of weight. He has a punching bag downstairs where he'll do that. We've got a weight ball, medicine ball, sit ups, pushups. We try to do a little bit of that each day. We don't always get that done. They're really short sessions. He has P.E at school. He will move. When the weather is nice he goes … oh, and he hits his tennis ball around. That's one of his favorite things to do. When the weather is nice, he'll do that plus shoot baskets either outside or at my mother's. There is a goal house down the street that's accessible to him.
- Umm, yoga, zumba, and water arobics That's it. And what do you do (towards participant)? Well, tell her what you do on the Wii. The days that she doesn't go to work at the gym, she would do 30 minutes of the Wii. And she was pretty consistent about that. So what kind of things did you do on the Wii - on the Wii Fit (towards participant)? Yoga, and zumba…the Wii zumba. Yeah. If it was was the weekend. What does - what do you do at Lifetime Fitness? Elliptical, bike, and the treadmill. And then some weights. And sometimes some sit-ups. Yeah, and then you Oh, she goes to the gym 3 days a week. Or 4 days because we do aqua on Saturdays. So 4 days a week for an hour. Her and I do our water class. We do our aqua aerobics class once or twice a week.

Stoplight Diet

<u>Tell me how easy it was to use the stoplight guide?</u>

- We didn't really use it
- We really liked it. It was pretty simple to do.
- It was pretty easy, I think I kind of looked over the Stoplight Diet the first couple of days and then got a good idea of what was red, green, and yellow Uh, so now she's

kind of in that mode where she's monitoring herself automatically. She knows it… she'll automatically say "this is healthy, this is not". She'll eat vegetables; she'll be like "no"… like pizza; she knows that's got a lot of fat or, you know, things like that. So it kind of all worked together. So now she knows when she goes to lunch, she'll take her meal and she's going to get fruits and vegetables at school. She can have whatever fruits and vegetables they have; but not an entrée…

- No. I knew what was healthy and since I made the meals I didn't think he needed to learn that.
- It was really easy to use. It was very helpful. If I didn't really know what she couldn't eat or anything we'd look at it.
- I only looked at it a few times, but I started limiting some of the bacon and the sausage and stuff like that. We just focused on the main thing which was his waffles, because he has OCD. He eats the same things over and over. I did eliminate the meats and only once in awhile.
- We didn't. We kept the turkey sausage and the turkey bacon. Terrance, most of the time he has a hot breakfast; I eliminated stuff like pastries and pancakes and waffles. We went more with bacon and eggs. I eliminated potatoes. He's a big potato fan.
- I think sit was easy because it was something that when I shared it with my mother. One example we were at HyVees and he wanted doughnuts and she immediately said to him, "Austin, what kind of food is that?" He responded it was a red food. Being able to talk through that process was much easier.

<u>How well did your child understand the stoplight diet?</u>

- I think she understood it "pretty well". I think at first she thought the "red" light meant "red-colored" foods. That they weren't…you know….or "green-colored" foods. But then I think you understood the…right? (toward Emily) That "Stop" meant "Don't eat…." ("yeah" from Emily). But I think cause…*I'm* the one that prepares most of her meals, we got away from that pretty quick; but I think that's what she thought at the very beginning…But then she caught on
- Sidney got idea of what was red, green, and yellow… because we would reiterate; and then at school they would reiterate… you know, fruits and vegetables. It made it easier actually when she went to school that her teachers were kind of monitoring her too
- It was easy. I think for Lauren, she's a pretty concrete thinker so if it was in the yellow light she would feel like she couldn't have any of it. Sometimes we'd have to talk it out; you can have a little bit. There's not enough stuff in the green light to...so it was learning how much of the yellow was OK to eat.

- I didn't go over it with him much because his attention span just doesn't work like that.
- I think he got it OK.
- He does. Yeah. He knows that the red foods, you don't want to eat very many of them. Green foods you can eat all you want and the yellows sometimes. Yeah, it's an easy system to manage.
- It says unlimited fruits and vegetables, and that's what we've been talking about. That those are good snacks. And even yesterday, she was - we were at the hospital most of the day, and then she came with me to work for a little bit. And she had a small piece of cheese pizza and then a huge, heaping helping of broccoli. And some peaches, so that was… Yeah, she's making good choices.

What aspects of the guide would you change?

- Um, I don't kn….I think it was pretty self-explanatory and I liked the pictures- where she could look at just the pictures of the foods and tell which were the good and ok to eat. I don't know what I would change on it.
- Change some of the yellow foods to green. Maybe to rule out that middle ground or try to make it more clear
- I don't think so. Nothing comes to mind right off hand. Having the different foods listed and having the different categories was extremely helpful.

iPad

What did you like about the iPad?

- Lose it was fun when I had time to do it. It was very fun… I could see where that could really help us…. just let me plan ahead when we got out…(you know)…because it had all the restaurants and things on it…because we had fun one night just looking up stuff that was on there…*like as a family*…even Noah was like "look up to see how much a blizzard is?" at Dairy Queen, or something (you know)…and we'd be like "oh, guess what it is?" We were just guessing, you know what I mean? And seeing who got closest…it was very fun
- It was easy…um, Emily was motivated by it. Um, the games and the pictures… Actually, she was motivated by all of it. She sent messages to your sister at school. We liked….. I liked the visual on there….particularly on the program; where you can see…where you put the food in & the exercise in. You could see it go down. I think it was a simple visual that she could get.
- Um, I liked it.

- Yeah he loved it. It was wonderful for him to take to school, to take pictures. That was a wonderful start. It got everybody on board at the school because it was being recorded. That was really cool so it was a great start.
- We liked it a lot. She loved the games. It really is easy to use and neat how you can see how it's tracking and I like the fact that you can see oh my gosh, I'm already three quarters to my limit and it's only half way through the day. I got to pull back a little bit. So yeah from I think it's good for kids like Participant.
- I really loved the Ipads. If there is any way you can give poor families one. Now it's Christmas. This would be really a good thing because the boys really love the Ipads and the mommies love them too.
- They were very convenient. She had to walk me through talking on them because, of course, I couldn't have figured it out on my own.
- I liked the fact that we were giving our teenagers a tool that they could self manage and they could use. It is …. a lot of times what happens with kids with special needs and Austin has autism, is there's not that expectation that they can use technology to organize themselves the same way we do. The fact that you guys included the technology so that …. And you selected an app that had really nice visuals, was easy to enter the information and also allow the kids to take pictures so that they can have more ownership for their eating habits, was a really nice thing. For Austin I especially liked the face time.I thought that that was a real good way to work on instructions for someone who doesn't really talk on the phone and to develop that attending and talking about the lesson. At the beginning, you probably thought oh my gosh, but after we could see the improvement every time and Austin doesn't talk on the phone a lot, so that was really a nice option to have as well. Yeah. The thing about autism is that because Austin's language and communication skills are his biggest area of need, he's often prejudged as not being able to do things. Austin has a lot of good skills. We just … sometimes I think this might have been a kid that could have been non-verbal.
- I think it was very easy. And once I did it a few times with her Then she was able to do it on her own. And I would check it most nights. There were a couple times that we were out of town in the midst of this, but I would check it... You know, sometimes she'd put in something as lunch that was really dinner - or you know, we'd make some adjustments? But she did a really good job about that.

<u>What things did you have trouble with?</u>

- I think if we had… like I said…if we had our Wi-Fi already, it would have been perfect. So it was just our fault because we didn't have the Wi-Fi yet, so we could not use a lot of the features like the facetime and scanning the bar codes on foods…: Because like I said…we couldn't…we couldn't track (you know) his miles (or whatever) like I wanted to on there…. like his speedometer steps and all that

stuff….but he did not play with it very much but that's just him(you know)…. he never has really been into that kind of stuff…like he would rather listen to music or play his drums….or things like that---he's never really has been into like any kind of games on the computer.

- I don't think there were any that we had trouble with. It was more '*operator*' … trying to get familiar with it
- It was ... It gets hard when I get really busy and tired. Because it's like homework, and I noticed in the past couple weeks. It's been like "Oh my gosh, I gotta get this in" …. But I was just like "Oh gosh... where…Sidney, is it charged up? You know, it became like really work because I wanted her to be more independent with it; but she's not. She's more independent with her choices, but like going to the….she'll go play on it and things like that; but she goes into her own world and likes to… you know
- No. I'm not a technology person. I just don't like it. It took too long. I think it would've worked better for me to stay consistent to just write them down.
- No not really.
- At first I was clueless. I'm not a gadget person. Once I got to doing it every day, I figured it out
- He didn't have any trouble because young kids use them in school
- We really didn't have any trouble with it. We didn't have any trouble with it.

<u>Tell me about any problems you had using lose it or istep log</u>

- Just without internet we could not log his miles on the ipad so I had to write them down on paper.
- It was fine if she could scan her foods, that was really east. But portion size was hard I think also for these kids to still conceptualize "sizes"…or "portions"…is hard. I don't know if…you know, you had icons of the portion sizes. Cause Emily put that she had 3 cups of pears; when she only had 3 slices of a pear. Or like one day you wrote down that you did like 3 hours of volleyball; instead of 30 minutes
- Sidney not understanding what a ½ cup is…. an 1/8 cup… or a full; you know? Things like that she wasn't very good at; but she could read and point at the pictures and type in what she had. She was pretty good at that. The exercise she struggled with a little bit. She was making up stuff. Like boxing for five hours… stuff like that. I was like "that's…. you didn't box for five hours, honey." Stuff like that
- It took time and I don't have it. There's so much; going to school and I'm always looking for an activity for him to get into and taking him to it or picking him up from it. I have enough to do.
- Nothing

- Entering the stuff was okay. It's just that I think you have to really be a routine-oriented person. There were days when we forget. Then somebody took it over and it didn't work out. Every day, yes. That was the hard part. I wish we could just do maybe a couple of days where we have to, like on weekends when we're really on the program versus every day.
- I think it was more of a hassle. Then again when I'm home on weekends, because I have him with me … Again, if he was in my sight every day it would've made more sense, because then I have to be mindful of what he's eating because then that helps me think of what is going on throughout the day seeing that visual.
- Right. One day I came home. We were all eating. The battery was just gone. It was like four or five and I couldn't enter anything.
- No. The only thing that would have been helpful for the Lose It app would have been to be able to print the documents, but managing that and going back and forth … it's really pretty straightforward and easy to use, good app.
- No. You know, the barcode is a little sensitive, so it would work or it wouldn't work sometimes. But for the most part it was fine. She loved (the fitbit). That was a source of trauma when we lost that. Yeah, because she really liked the FitBit.

<u>What did you like about the Facetime meetings?</u>

- I think they would have been helpful if we could have got them to work.
- I think that it was really easy. She felt like pretty big stuff having someone call her every week, it really kept her on track.
- It actually for me… was stressful. Because, I guess, my schedule is so busy. You know what I mean? My schedule is so crazy all day long so coming home and having to remember something is like… I mean, just trying to remember to help her with her homework and just getting her stuff ready for her. We get up at 4:50 in the morning so I would… I would be tired by 8, 8:30. I'm like…you know, just helping her with her homework; we get finished with that. She has chores. We have clothes to wash to get her ready for school and every day she needs something different: Cheerleading outfit, workout clothes for her gym class…. Um, different clothes for her volunteering when she goes to Harvester's. A different outfit for… I mean, she literally would be going with bags of things of stuff, and then... Right! So that why…I'm just like…"Ah, was I supposed to?" You know… but for the most part, I think the Face Time helped keep me on track a little bit because… you know, day to day stuff everything goes…"Ok, if it's not done right now…!" So, you know, when you 'did' check in… it was good. I would remember: "Oh gosh, it's Sunday… I need to call Lauren!" I didn't get to talk to her this week! So that kind of did help; I think I'd be all the way in wherever zone… just crazy people zone, I guess…
- Yeah that would remotivate me to start writing them down again or putting them in, yeah. They were good but it was hard to remember to do them. I know it puts more

work on you but I'm guessing if you just had their phone number and sent them a text reminder like an hour or so before or that morning or something or the day before. We try and put it into our calendar so we don't always do it. I know you would send messages to the ipad but I think sending them to the cell phone would have been better, even to help remind her to enter her food and wear the fitbit.

- I liked that. Oh yes I did. I did. It helped to keep us on track and it was not very inconvenient to our schudual. I think because I'm not … I just don't … I have trouble remembering. I think again, I think other families probably wouldn't have any problems meeting that schedule because you made it so easy, so convenient. You're just calling once in awhile on an Ipad. That was the problem. It wasn't your scheduling the meetings. It was me having to remember. That was a "me" thing.
- It was helpful to have questions answered especially in those first weeks. It was just hard that Terrance didn't want to do it, do it was more us talking than him and you.
- I think it was a good way to interact, to go through the lessons and to do it in a way where it didn't require us to be some place at a certain time because our schedules are busy even in the evening, or you to be some place at a certain time. It was an excellent way to get that lesson, for you to share information, provide that input. He looked forward to the calls. It was … convenience was probably another one of the big things. It was not a burden at all. There were a couple of times when we were running late and it was easy for us to adjust our times because we were going to use face time to handle our lessons as opposed to physically being some place.
- Yeah, that worked out, huh(towards participant)? Yes. Yes(I think it helped her out). Yeah, that worked out (for her to be told what she could improve on). No (it was not a burden). I mean, I think, other than the normal scheduling glitches -- I think it was fine.

<u>How easy or hard was it to take photos with the iPad?</u>

- Yeah, easy for me…my husband didn't know how to do it (laughs). He never really wanted to take pictures but Brooke would help him out, she was really good at that and she is only 5. She was so funny, they had switched the screen one time & it was that blue screen…that blue crazy screen! I said "Brooke, come in here & fix this for me….and boy, she just fixed it. I was amazed….
- It was great, she loved to take pictures. She would sometimes flip the camera around and take a picture of herself instead of the food by accident but other than that there were no issues. It was definitely easier than using a digital camera. Emily still can't figure out how to use one of those.
- That was pretty easy and Sidney really liked it.
- I don't think it was hard at all for him. Yeah he likes that kind of stuff.
- It's easy but it was hard to remember. It's hard because when you eat a food and then you realize you have to take a picture and you already ate it

- Yes. He's got lots and in fact sometimes he took pictures of food that I didn't know that he took. Yeah. Some of the pictures were blurred. That was another skill that we could work on. We could work on making sure that that picture included all of the items and that it was a good picture, so yeah. A lot of skill building with the way you guys designed that. Easy to take the pictures. The thing that he … because this was a new skill for him, he needed to just know that not only do you want to push the button, but you actually want to make sure that you have a clear picture. That is a separate skill where we could look at it, pull it back, have him take a look, see that it was blurred and retake it.

Future

Now that you have completed the study how will you use this information in the future?

- Well, first of all…I've learned he doesn't need to eat as much as he's been requesting before (you know?). And that he will eat different things. He tried some fruits that he had not tried before; and (I said) it got easier for us because we were kind of on the program saying "no, you're done…(you know?)…because we *all* can benefit from that…telling ourselves "Ok, you're done, you know?" Because you sit here at the table and he eats so fast…that (you know) he always thinks he wants more & more. This helped us realize how much he really needed to be full. And once he ate, I mean he didn't ask for more the entire night…so it's not like he was telling us he was hungry all night (you know?). So we definitely learned (you know) some things he could eat, and that he needed less amount.
- I think one thing that we both learned a lot about was our serving sizes and we are going to keep up with that in the future.
- Portion size… counts for a lot. I mean, just knowing that… you know, you can actually shrink the size of your stomach a little bit with your intake so that you don't even crave as much food, but it takes… it takes a few weeks to get there; but I think portion size. If nothing else.. portion size and just knowing … and I've always kind of known this in the back of my head anyway; but just seeing when like using the iPad app Seeing like how much vegetable you can really, truly eat… and how much it amounts to nothing ? And how you can exercise and go from thinking that you're about to meet your 1200 calorie quota to next thing you know… you've thrown in some exercise, and next think you know you're down to 600. You're like "How in the world are you going to even make it to a thousand calories?" You know what I mean? I'm like… "Wow, this is pretty cool!" so I think that helped me to learn like …. exercise is super important . Portion size is important; but vegetables … like you were saying are "really important." You know, I really can't… when I see her eat anything…I'm like "Uh" sometimes it's like so hard to get vegetables in when you're

a busy family. Like if I don't go grocery shopping and my husband eats up all the vegetables too; so um, I think that just really solidifies for me like: "you can have…you know; you can eat whatever you want as long as it's like…"this much meat" or "lean meat." Of course I knew that because my husband eats healthy… But I mean just really seeing it; how it's affecting her. How simple it… you can make it even for people with special needs. I don't think there's really an excuse for anybody anymore. If they just learn "that"; and they can stick with it for a few weeks, I think that anyone… you know "anybody" can follow. I… I give no excuses. I always say "If Sidney can do it; I don't want to hear it". You know what I mean? I don't want to hear any excuses from any people.

- Keep doing the meals for lunch time and send him over to Tammy. I want one over at Tammy's too because portion control is big over there and what they eat is fatty. She does have diabetes but she hasn't learned yet that she has to watch what she eats. She's exercising like crazy but she's not eating properly.
- I think we have a much better idea of how to eat and how many calories are in foods and how to track a little bit better and the importance of exercise
- We're definitely going to make it a lifestyle change, because I know I'm not going to go back to trying to do fast food as other meals. It's easy but at the same time it's so unhealthy. I think just understanding that and taking the steps that we've taken to eliminate certain things. Because OCD runs in the family, I have to make sure that we're not having bad habits. Start fostering the good and then they become the habits that we want to keep; definitely more salads, less juices, less pop, more water.
- More vegetables, more fruit. Exercising.
- I think we will continue to use the app. We will continue to use the pre-portion meals. We'll continue to use basically all of the information that you shared with us. It was a nice package that you guys put together, really nice package.
- We're gonna keep on with the portion control and keep on with the LoseIt! We're gonna keep tracking, aren't we, Caroline?

<u>When you think about prepackaged meals what is the likelihood you will eat them in the future?</u>

- Oh I bet we'll use them quite a bit. It's something he can fix himself and something that's easy to keep track of. It just helps so much with portion control. Because you look at it and on the plate you think…"gosh, that's not very much" but then you eat one…I mean it fills you up
- I had people asking me… like her teachers and stuff? They're asking me like: Where did you get those? Like how much did they cost? Like Sidney's losing like a ton of weight… and she's doing so good with it… and you know I think everybody wants it to be easy… So I know they have like all those TV things that are saying like "prepackaged meals" and all of that It really works. I think the hard thing will be just

trying to monitor the salt intake for most of the frozen ones. Um…so what I'm thinking is… my game plan for now that we're done with this…I have to be realistic. You know, there's going to be some times when ideally I want to make Sidney's lunch every day, but that's not gonna…that's not realistic (laughs). So just getting her five meals a week at least so that she'll have 'em for school? And then letting her have shakes in the morning. Um, what I was going to ask you… is I usually do frozen fruit in her shakes? But I'm thinking of doing like… you know, giving her the "soy" as opposed to the fat milk, or either… maybe even skim milk; and um, I was thinking about the… "Breakfast?…" What do they call those things? Those instant breakfast things.

- I have to, at least for now
- Probably the Smart Ones, I think those are great. They taste pretty good and it's that fact that the calories and the nutrition are already packed in and it makes it really easy to use them
- I will use prepackaged, because like I said they're very convenient
- I really haven't shopped around to see which ones … To learn about the calories. Of course, I'm going to be looking for taste and less calories
- He'll eat them. We were already using prepackaged meals for breakfast because they are convenient. We have the portion control. It was enough too that I knew he had enough to eat. Doing so more on the weekends when we're at home and we're doing a lunch, I think that we will probably increase that, because again another way to get variety and portion control and manage his calorie intake. He'll eat them.
- You know, I think that that's probably a good idea for the days that she eats out at school to get the Weight Watchers or the Lean Cuisine meals. I think that's an easy way to make sure it's portion controlled. And it's convenient for her to take that along with some, you know, fresh fruit or fresh vegetables from home.

<u>How would you feel about continuing to track your dietary intake?</u>

- Yeah I think we would do it…because I noticed just the difference eight pounds looks on him…you know? I mean really it does. His clothes fit better…
- I think it's really helpful. Yeah, to write it. I think for anyone it is. To write down what you're eating; everything you're eating. In between, and snacks…
- I think as long as she is eating those meals we will be fine and won't need to keep tracking.
- I'll keep track of what he eats in a day. I won't write it down but I'll monitor it because I can. It's got Tammy on board which paying attention to what he's eating and how much and it's really helped.
- Yeah we may download that Lose It! app.
- Yes, on weekends. It's more convenient for me on weekends.

- Yes. It would be better if it was the person doing it versus us trying to figure out what happened throughout the day and all that stuff, I just don't know if he could have done it. I guess honestly I never even had him try.
- I want to do that. I'm actually looking … this is a really nice system. Not having to write things on a log. Writing the information on a log is a burden. I've been able to scan the foods, so we scanned a lot of things. I'm going to miss the fact that we don't have that history, those things and the my food selection, but it's a pretty nice system to be able to maintain.
- We are going to keep doing that. Yeah. I'd love to keep one of your sheets - a blank sheet that we could copy? So she could also be responsible for tracking. You know, that way, and we'll also put it on my iPad.

How would you feel about continuing to track your physical activity?

- He has football practice and that keeps him accountable, so we may have to figure something else out for next semester.
- We made a sheet we can write down what she is going on what day to keep track, so yeah we are going to keep doing that.
- mm-hmm, like this weekend she didn't have as much physical activity. I tried to get her out to walk as much as possible, but it was cold and she didn't want to do it… so that was challenging
- You know what, there is a program at the school that asks for input and I have been writing it down but they just leave them in his backpack so what good does that do. Just knowing that he's getting it and actually I think he's starting to...this was his first week to actually go with Tammy. It's his first week back in school and all that kind of stuff but she wants to lose weight so he's her workout partner so it's awesome. It really is.
- Yeah. I think we have a goal of just getting some activity in every day
- I will just make sure that he does it, not sure if I need to write it down.
- Yep. In fact Austin got to the point where he would do something and when we were riding home in the car, he would talk about having to add the physical activity that he did. That worked really well, including housework. One time he was doing his weekly chores and he said he needed to add the housework to that.
- We will keep doing that too.

Suggestions

What do you feel we can improve?

- I would just make sure everybody has all the technology. Because that's the only thing that was frustrating to me…because I was like "Ugghhh…" it was so hard and trying to get somewhere that had Wi-Fi. And just to make sure all the families have that.
- Um, the only part that I was noticing is that I was doing most of the food input. I don't know if there's a way to make it easier for the kids…um, you know, more visual. . I…I visualize like the board-maker programs where the things that have just like the little icons….or where she could look at it and almost point to the foods she had … um; that would be a huge amount of foods in there.
- It's nothing you can change, but I just didn't like having to enter everything on to the ipad, it was time consuming. However, I can see it being helpful for others.
- think older moms maybe don't want to do the technology part. Maybe the young moms are into it but I'm not and maybe other older mothers are not right now. For him, technology was a great motivator for him to be able to have a new device and take pictures with it but I didn't like writing it down. If I could just write not type, write it down. Maybe if he could do it on his own, but he can't. Old fashioned. Would've been better for me.
- The only thing that I think you could improve on is the packaged meals, just making them taste better.
- Give an Ipad to keep. I think the program would've been just way better at the end if we were able to keep the Ipads, because special needs kids they need that for communication. All the aps they can download, especially … I'm not trying to single certain families out but like low-income families. They probably should find a way to give them some kind of incentive like that. I also suggest that you guys, because they're prepackaged meals, that you monitor proper blood pressure. I don't know if you guys are able to do that
- I would say the money for the fruits and vegetables. Then like she said, the gym membership, if they made it affordable where they could, while they were doing the program or whatever; even after the program is over, if they gave a big enough discount where they could join a gym. Make it a family thing, because when you take your child. He won't do anything by himself. If you can get the family moving where they're participating in a family gym membership somewhere
- Let's see. I think if you guys are still working with our population, I don't know … because summer time is probably better or maybe a longer time period. I think that probably a longer time period might be better because our kids, young adults, they're not little kids anymore. Sometimes it takes a while to get all of those skills that we want them to have. As a parent we're looking at a lot of separate skill building as well as to weight loss. For example for Austin we were looking at independently doing everything as a part of that process. Being able to have

ownership and management of his weight loss and giving him the tools to be able to do it. Utilizing technology, the camera, the face time, all of those type of things. Probably a longer time might be helpful just to be able to look at that progress, going through various seasons when there's various things about one. Then also looking at how well it's being maintained. Austin, I'd like to get 100 pounds off of him. We have a lot of weight that we need to get rid of on the healthy choices and eating habits. That's probably the biggest thing that comes to mind. Austin doesn't have a reason to want to do it for himself. Some kids are concerned about what others think. Austin doesn't have that concept of being concerned about peer pressure or anything like that. He has no incentive for losing weight other than we've talked about the fact that when he loses 50 pounds we're going to … where are we going to go? To the beach, but that's not strong enough to be able to say no matter what I want to get rid of these pounds. Being able to work towards that goal has probably the most meaning for Austin right now. If we were looking at a situation where there is some type … not enough money to pay for going toward the beach, because he doesn't have that strong concept of I need this amount of money. For him to be able to look at making a contribution to that would be a good thing. Then we could say okay Austin, you've lost these pounds, you've earned this much money. In fact that's one of things that I've thought about being able to do is provide … as we get more involved in this process, be able to provide small amount for pounds lost to just … so that he can see getting closer to that goal.

- Hmm. I really do think this was done nicely. I mean, I liked all the components. I liked the FaceTime. The iPad, that was a nice incentive to, you know, if you continue tracking then you can play the games on there. I thought for this particular age group that was probably really good. You know, I thought the FitBit was a great idea. Um, so yeah, that was all. We wish we could keep going.

<u>Would you do this program again?</u>

- Yeah!
- Mm-Hmm. Yeah. I think it was very worthwhile.
- Yes, I love it!
- Oh yeah. Perfect time. Definitely we needed. I didn't know I could be so involved I guess and have a hold on what he ate like I can and I needed to know that. He was this way pretty much because it's cheaper to have him eat at school. It was easier to have him eat at school but I didn't like him being overweight. It just really helped me be aware of what I could do. It will make a whole big difference in his life because now he'll be able to do the activities that when he was too heavy he couldn't breathe and that kind of stuff.

- Yeah we'd do it again Overall we liked it, it was just kind of hard. There was nothing really hard but it was just remembering to do it. That is what was hard. But having her finally lose some weight really made the hassle worth it.
- Mm-hmm (affirmative), I would. I want people to embrace it because I'm glad that somebody's now aware that special needs children, their waistline is way too big. For one, they take lots of medicine. That's affecting their health and weight. I'm glad somebody's realizing that and wanting to do something about it. I give it A+.
- Yes, I would do anything for his health. I think it was a good program for the same reasons, because once they get to be an adult they're free to eat whatever they want. This kind of gave them some guidelines, some limits. Then they were full.
- I would and my schedule is so crazy that there's not a whole lot of extra things that I'd take on. Weight reduction is and eating healthy is one of the things that is very important to us. The tools that you've shared have been very helpful in continuing that program. I like it, I really did and I told several people, family and friends about it. I bragged on you guys. If it had been something that would have been burdensome for us or if it had been something that we wouldn't have been able to do for whatever reason, I would have had to bow out because we just don't have that kind of flexibility. The fact that you were … you did a great job too. You worked with our schedule. You provided information. I was able to ask questions about different things. Yeah, I would do it again. I love the program. I love that you guys put … added the technology part of it. I think providing the kids with the iPad and feeling comfortable that that was a part of the program was huge. I think it was just a well designed, usable study. Even though we didn't have the maximum weight loss for a variety of reason, it's still a wonderful thing for us to be able to continue on with. I really liked it. I liked it a lot.
- Yeah. Definitely. This - the food. You made it so easy. And, um, that was - the iPad and everything else. It was great.

Parent Involvement

<u>How did your physical activity level change as a result of your participations in this program?</u>

- Um, maybe a little bit? But…not much
- Well, just going to her games! *(laughs*). I had to become a little bit more active! I can't say…um…I guess… I guess I've become a little more active. But I'm still not active as I should be… cause I'm so active at work. I guess when I get home I'm just… I'm just tired. But I will…well, I guess I would say to some degree "yeah" cause I notice like when we go to the mall. Like I will purposely walk the mall…. like way more than I probably should. Um covering…like normally I'm like "uh, let's just

stop.." but now I'm like you know…I'm all…in the back of my head I'm always thinking about calories burning… not for myself but for her.. yeah. Cause I'm like 'I know she's going to want this good sandwich…I'm going to walk around'.. (laughs)

- Maybe I wouldn't have joined the gym, probably not because...I have taken more of a focus on accomplishing professionally rather than focusing everything on Spencer and so yeah. We joined the gym and so that's good because I feel better too. We go to the gym on weekends. We haven't gone...when he wasn't going to school we went during the week but now that school is back in session, Tammy has got him going and...Single moms have a lot to do.
- Not really because I tend to exercise. We have a dog so I walk the dog every day or I go to an exercise class a couple times a week. For me my exercise didn't change. I just encouraged her come along
- The other thing that's changed with us we've increased in our activities. Now Eugene has always been physical, because he exercises more than us. That's why he's skinnier than us. I see now we want to go walking with him because he walks two times a day, three times a day. I would just sit at home. Now when I see him going walking, I want to go walking with him I would say activity's increased with that, with me. I'm more mindful of what I'm putting in my mouth. Then right before I got on the program, I started Weight Watcher's too. I think it is working.
- No. Maybe had it been springtime, because I like to walk we would have gotten more.
- Not a whole lot for me. The things that we did at home that involved the weights and some of the movements associated with that, I might have done a little bit of that with him. Part of my goal was to say to him, "Austin, it's time do your exercise," and him do it without my involvement. I don't swim. I don't play basketball. I don't do any of those activities.
- Well, I already work out 6 times a week, so it was probably the same

<u>How did your diet change as a result of this program?</u>

- Uh, it did….I think portion size. It made me more aware of portion sizes. I found myself wanting to set a better example for Emily. So I was getting me and Emily more vegetables. And kind of being aware of … that I was getting enough of my servings a day also. So those would probably be the two biggest things.
- : Um…No…cause I mean we…my husband eats healthy so it fell right in line with what…we still have our healthy days and then we have our days when we just kind of fall off… or when we eat just what we want. Um…so on those days, I noticed I had to be more conscientious of making sure, you know, I did have an "alternative". More vegetables. So I had to make more vegetables for… because usually it's just

like my husband is just like “well, get me tons of this” or “tons of that”. So now it’s just like “ok”. It was just a little bit more of the same

- Probably not. My dad was a gardener and he always had half an acre of garden and so I was raised on all kinds of vegetables and I just keep eating this way.
- My diet did change some. Some days I was bad with her but I did think more about what we were eating and what the content was. Yeah we tried to not go out to eat quite so much, tried not to do so much fast food. We tried to put more protein, chicken and things like that in the diet and definitely more fruits and vegetables. Every time she said can I have a snack I'd say how about some fruit. I'm a big fruit person anyway so we just incorporated that in more and just putting vegetables and fruit out before we even start dinner so that we could eat those first and then fill up a little bit.
- Of course, I’m making vegetables for the whole family. We ate more fruits and vegetables, drank more water.
- For me, we did the same. We increased fruits and vegetables. Increased water intake. Less visits, because we are an eat-out family. We totally changed that. If you didn’t have us in the program right now we would be at a restaurant eating. That’s what we do for pastime. That’s changed a lot. Finally, we had gotten Gene on board to understand that we need to have other things to celebrate family, because he sees it as bonding time. We’re doing other things now. Going to church is bonding time or visiting a museum; doing something other than eating.
- Because we’ve both been working on healthy eating and we have to have things in the house that are going to meet that requirement for both us I actually ended up losing some weight. I probably paid a lot more attention, but I did not try any of those prepackaged meals. I did have shakes with him.
- Probably not my diet, but my portion sizes did.