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‘Keep moving!’ occupational therapy guided Zumba fitness health-promoting program for youth with learning disabilities or attention-deficit/hyperactivity disorder

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‘KEEP MOVING!’ OCCUPATIONAL THERAPY GUIDED ZUMBA FITNESS HEALTH-PROMOTING PROGRAM FOR YOUTH WITH LEARNING DISABILITIES OR ATTENTION-DEFICIT/HYPERACTIVITY DISORDER

by

INBAL REGEV LAVY

B.OT., Ono Academic College, Israel, 2015

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Approved by

Academic Mentor _____

Simone V. Gill, Ph.D., OT, OTR
Associate Professor of Occupational Therapy
Associate Professor of Psychological and Brain Sciences

Academic Advisor _____

Karen Jacobs, OT, Ed.D., OTR, CPE, FAOTA
Associate Dean for Digital Learning & Innovation
Clinical Professor of Occupational Therapy

“An active mind cannot exist in an inactive body.” -General George Patton

DEDICATION

I dedicate this project to my husband Adi who supported and encouraged me every step of the way. I could not have done it without you.

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‘KEEP MOVING!’ OCCUPATIONAL THERAPY GUIDED ZUMBA FITNESS HEALTH-PROMOTING PROGRAM FOR YOUTH WITH LEARNING DISABILITIES OR ATTENTION-DEFICIT/HYPERACTIVITY DISORDER

INBAL REGEV LAVY

Boston University Sargent College of Health and Rehabilitation Sciences, 2020

Major Professor: Simone V. Gill, Associate Professor of Occupational Therapy, Associate Professor of Psychological and Brain Sciences

ABSTRACT

Obesity is a public health concern and a major risk factor contributing to physical and psychological problems. It affects participation in occupations and increases healthcare-related costs. Certain populations are at risk of being overweight and obese. These include people of low socioeconomic status, racial/ethnic minorities, and individuals with disabilities. Adolescents diagnosed with learning disabilities (LD), and/or attention-deficit / hyperactivity disorders (ADHD) were also found to face difficulties in maintaining a healthy weight and engaging in healthy behaviors. While occupational therapy practitioners often address the academic and behavioral performance of children and adolescents with LD or ADHD, special attention should be given to weight-management and health promotion.

An occupational therapy guided, health-promoting program was designed to address this gap. The 12-week program, named “Keep moving!” is intended for adolescents with LD or ADHD in schools and community centers. It incorporates Zumba dance activity, which

is a form of a moderate-to-high intensity aerobic exercise. The foundations of the program are based on The Trans-Theoretical Model of Behavioral change and The Individual and Family Self-Management Theory, which enable individuals to take a significant part in the process of managing their health. The key features that were identified in the literature as most effective are applied in the program; establishing health-promoting habits and routines at home and school, adding weekly fun and engaging physical activities, providing information regarding healthy lifestyle components, instilling self-management skills, and establishing family support. The program evaluation plan utilizes both formative and summative evaluation approaches. A similar program could be applied to other populations at risk for overweight and obesity by adjusting the type of physical activity to accommodate the abilities and interests of other at-risk population groups.

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LIST OF ABBREVIATIONS

ADHD	Attention-Deficit / Hyperactivity Disorder
BMI	Body Mass Index
BU	Boston University
IFSMT	The Individual and Family Self-Management Theory
LD	Learning Disabilities
OECD	Organization for Economic Co-operation and Development
OT	Occupational Therapy
OTPF	Occupational Therapy Practice Framework
PHWMA	Pizzi Healthy Weight Management Assessment
TTM	Transtheoretical Model
WHO	World Health Organization

CHAPTER ONE - Introduction

Obesity

Obesity is a significant public health concern affecting more than half a billion people worldwide, and its prevalence is rising rapidly across the industrialized countries (Bhurosy & Jeewon, 2014; Stein & Colditz, 2004). Overweight, defined as having a body mass index (BMI) greater than 25, is one of the most significant risk factors for physical and psychological health problems. These include chronic conditions such as metabolic disorders, Type 2 diabetes, cardiovascular disease, depression, and acute conditions such as colon cancer (Faith, Matz, & Jorge, 2002; World Health Organization, 2016). Obesity has been linked to almost 300,000 deaths each year, and $117 billion in direct and indirect annual costs in the United States alone (Stein & Colditz, 2004).

There are many underlying causes for being overweight. These are thoroughly discussed in the current scientific literature, and include family genetics, consumption of highly processed food rich in fat, simple sugars and salt, as well as lack of exercise among others (Apovian, 2016). Lack of access to healthy food, opportunities for physical activities, and access to green spaces were also identified as potential causes (González, Fuentes, & Márquez, 2017; Kuo et al., 2013). Increased exposure to advertisements for processed food and carbonated drinks in all media channels, could possibly be linked to overweight (Lobstein & Dibb, 2005). Moreover, the accessibility of these foods, their low cost and high availability, makes unhealthy diet more accessible than ever.

Changes in transportation, communication, workplace and domestic-entertainment technologies in the past decades have been associated with significantly

reduced demands for physical activity and increased sedentary behavior (Harold W. Kohl, Cook, Environment, Board, & Medicine, 2013). Sedentary behavior leads to a reduction in overall physical activity energy expenditure. However, while individuals may meet public-health guidelines for weekly physical activity, prolonged periods of sedentary activity may still compromise their metabolic health (Owen, Healy, Matthews, & Dunstan, 2010). For example, chronic, unbroken periods of muscular unloading was found to be associated with reduced glucose uptake from the blood into muscle cells. It was also found to be associated with suppression of skeletal muscle lipoprotein lipase activity, which is necessary for triglyceride uptake and high-density lipoprotein (HDL) cholesterol production (Hamilton, Hamilton, & Zderic, 2007).

Physical inactivity is another important risk factor causing obesity, as well as other chronic diseases (Knight, 2012). More than 80% of adults in the United States do not meet the guidelines for both aerobic and muscle-strengthening activities, and more than 80% of adolescents do not meet the national guidelines for aerobic activity (Office of Disease Prevention and Health Promotion, n.d.). Lack of physical activity may result in reduced health-related quality of life, inferior functional capacity and could cause negative mood (Ahn & Fedewa, 2011; Harold W. Kohl et al., 2013). Moreover, consciousness of weight stigma, regardless of objective weight status, may negatively affect individuals' willingness to participate in physical activity (Schmalz, 2010).

In the past few decades, childhood obesity has increased dramatically in developed countries. Between 1980 and 2013, the combined prevalence of overweight and obesity among children has increased from 16.5% to 23.2% (Freemark, 2018).

Similar trends, though with lower prevalence rates, were noted in low-income, developing countries (Freemark, 2018). Cross-sectional studies suggest that intake of sugar-sweetened beverages and high-fat foods is associated with weight gain in children (Bucher Della Torre, Keller, Laure Depeyre, & Kruseman, 2016; Dubois et al., 2016; Emmett & Jones, 2015; Millar et al., 2014). However, direct support of this hypothesis on a population scale has not yet been proved, due to difficulties in obtaining accurate data (Freemark, 2018).

Not only does obesity pose physical risks, it can exert an emotional toll on children and their families as obese children may face social stigmatization, discrimination, bullying, self-criticism, and negative self-image (Freemark, 2018; Kuczmarski, Reitz, & Pizzi, 2010; Puhl & Heuer, 2010; Scaffa, Reitz, & Pizzi, 2010). Depressive symptoms are more common in obese than in lean children, but the relationship may be bidirectional; obesity may lead to feelings of sadness, frustration, and hopelessness, while depression and its treatment with certain psychotropic and other drugs may cause disordered eating and excessive weight gain (Freemark, 2018).

Adolescence Obesity

Participation in everyday activities is considered to be a vital part of children's development, which is related to their quality of life and future life outcomes. Studies indicate that children that are obese may experience reduced opportunities for social participation and engaging in play at their home and school (Lane & Bundy, 2012; Pizzi & Vroman, 2013). They are also less likely to participate in physical activity, including leisure time activity (Trost, Owen, Bauman, Sallis, & Brown, 2002). Lack of physical

activity among youth may result in negative health outcomes (e.g., aerobic fitness, blood lipids, blood pressure, body composition, glucose metabolism, skeletal health, and psychological health) (Bungum & Vincent, 1996; Butcher, 1983).

Being overweight or obese can limit a person's ability to participate in meaningful, satisfying occupations, which is not only important to health and wellness promotion but is also an issue of social and occupational justice (Cantal, 2019; Pizzi & Vroman, 2013). In a study from 2013, the authors present evidence that in developed countries, educational attainment of children is also negatively correlated with obesity rates and social class (Cohen, Rai, Rehkopf, & Abrams, 2013).

The American Occupational Therapy Association reported that various occupational therapy interventions could be effective in the area of weight management for children (Reingold & Jordan, 2013). Therefore, early occupational therapy interventions for childhood obesity may prevent delays in motor development and adverse psychosocial influences, as well as the range of additional health problems caused by adult obesity (Hong, Coker-Bolt, Anderson, Lee, & Velozo, 2016).

At-Risk Populations

Certain populations are considered to be at higher risk for being overweight and obese. These include individuals from low socioeconomic status, ethnic minorities, and individuals with disabilities (Apovian, 2016; Freemark, 2018; Reingold & Jordan, 2013). A group of particular interest is individuals with neurodevelopmental disorders. Based on parental responses to survey questions, approximately 15% of children in the United States ages 3 to 17 years were affected by neurodevelopmental disorders in 2006–2008

(Boyle et al., 2011). Neurodevelopmental disorders are disabilities associated primarily with the functioning of the neurological system and brain (American Psychiatric Association, 2013). The disorders typically manifest early in development, often before the child enters grade school, and are characterized by developmental deficits. Examples of neurodevelopmental disorders in children include attention-deficit/hyperactivity disorder (ADHD), autistic spectrum disorder, learning disabilities, intellectual disabilities, developmental coordination disorder, and impairments in vision and hearing ("Neurodevelopmental Disorders," 2013). Children with neurodevelopmental disorders can experience difficulties with language and speech, motor skills, behavior, memory, learning, or other neurological functions.

Many children affected by neurodevelopmental disorders are diagnosed with more than conditions. About 4% of U.S. children have both ADHD and a learning disability, and one in five children in the USA have learning and attention issues (Horowitz, Rawe, & Whittaker, 2017; Pastor & Reuben, 2008). Diagnosis and treatment of these disorders can be difficult; treatment often involves a combination of professional therapy, pharmaceuticals, and home- and school-based programs.

Specific Learning Disorder

Specific learning disorder (SLD), commonly addressed as Learning Disability (LD) is a neurodevelopmental disorder that is diagnosed at school-age ("Neurodevelopmental Disorders," 2013). It is diagnosed by a qualified school or educational psychologist, by a clinical psychologist, or by a clinical neuropsychologist who is trained in the assessment of learning disabilities("What Are Learning

Disabilities?," 2013; World Health Organization & World Bank, 2011). Learning disabilities vary from individual to individual and may present in various ways. They may manifest as a difficulty in: (1) processing information by visual and auditory means, which may impact reading, spelling, writing, and understanding or using language, (2) prioritizing, organizing, solving mathematics, and following instructions, (3) storing or retrieving information from short- or long-term memory, (4) using spoken language, and (5) clumsiness or difficulty with handwriting. All these skills are foundational to one's ability to learn.

Attention-Deficit / Hyperactivity Disorder

An estimated 8.4 percent of all children in the United States 2-17 years of age have Attention-deficit/hyperactivity disorder (ADHD) (Danielson et al., 2018). ADHD is a neurodevelopmental disorder characterized by symptoms of inattention and/or hyperactivity-impulsivity, occurring in several settings and more frequently and severely than is typical for other individuals in the same stage of development (American Psychiatric Association, 2013). Many children with ADHD have a combination of inattention and hyperactivity/impulsivity behaviors, while some may display primarily hyperactive behavior traits, others may display primarily inattentive traits. It is possible for an individual's primary symptoms of ADHD to change over time (Nigg, 2006). Children with ADHD frequently present with other disorders. Parents report that about half of children with ADHD have a learning disability and about one in four have a conduct disorder (Larson, Russ, Kahn, & Halfon, 2011; Pastor & Reuben, 2008).

ADHD is often first diagnosed in school-aged children when it leads to disruption

in the classroom or problems with schoolwork and it is more common among boys than girls (Danielson et al., 2018; Pastor & Reuben, 2008; "What Is ADHD?," 2017). Children with ADHD generally have trouble with certain skills involving problem solving, referred to collectively as executive functions. These skills include working memory (keeping information in mind while briefly doing something else), planning (organizing a sequence of activities to complete a task), response inhibition (suppressing immediate responses when they are inappropriate), and cognitive flexibility (changing an approach when a situation changes). Children with ADHD also generally have problems in maintaining sustained attention to a task, and/or maintaining readiness to respond to new information (Aguiar, Eubig, & Schantz, 2010; Barkley & Murphy, 2006; Nigg, 2006).

While students with LD and those with ADHD are a heterogeneous group, difficulties in self-regulation appear to be shared for individuals with either condition. Those difficulties manifest as challenges in inhibition of behavior, delay of gratification, and persistence while engaged in activities requiring self-regulation. Other challenges related to self-regulation skills include difficulties in producing the amount and quality of work they are capable of, maintaining on-task behaviors, following through when given instructions, and planning and directing goal-directed, future-oriented actions (Harris, Reid, & Graham, 2004).

Neurodevelopmental disorders such as LD, ADHD differ in their severity and in the way they display in different individuals. These disorders may affect not only learning performance but also other activities and occupations, such as academic achievements, activities of daily living, social participation, play, work, and social

relationships ("Neurodevelopmental Disorders," 2013).

LD, ADHD and Obesity

Several studies have found that children and youth with ADHD are at higher risk for obesity and overweight. In a study conducted in the Netherlands with 372 children with ADHD ages 5-17, researchers found that boys ages 10–17 and girls ages 10–12 were more likely to be overweight than children in the general Dutch population (Fliers et al., 2013). Overweight appeared more commonly in boys with ADHD ages 10–12 and 13–17, and underweight less commonly in boys with ADHD of all age categories, providing the overall impression of increased weight in boys with ADHD. Another study encompassing 45,897 participants in the USA, of which 506 were diagnosed with ADHD at the ages of 10-17 years old, found that youth with comorbid LD and ADHD were significantly more likely than peers without LD or ADHD to be obese (Cook, Li, & Heinrich, 2015). Similar results were reported by a meta-analysis of 42 studies, which found evidence of a significant association between ADHD and obesity, regardless of possible confounding factors such as psychiatric comorbidities (Cortese & Tessari, 2017). The pooled prevalence of obesity was reported to be larger by about 40% in children with ADHD compared with those without ADHD, and by 70% in adults (Cortese & Tessari, 2017). These results were found to be significant when considering confounding effects such as socioeconomic status, comorbid depressions, or comorbid anxiety.

Occupational Therapy, LD and ADHD

Occupational therapy practitioners often address academic and behavioral performance of students with LD or ADHD. However, special attention should be given

to healthy lifestyle components and weight-management in general (Pizzi, 2016). Occupational therapists can play a pivotal role in formulating physical activity programs that address health management and wellbeing. They can provide meaningful, client-centered, and effective interventions that would motivate client's' participation in order to modify daily life habits, roles, and patterns. Occupational therapy interventions in the area of obesity may include but are not limited to the following: community programs of health promotion through lifestyle change; education programs; development of new habits and routines; wellness programs for children, teens, and adults; play and physical education in the schools (Salles-Jordan, 2007).

Addressing the Gap

Increasing the amount of daily physical activity can help prevent weight gain while providing other positive health outcomes, such as increased physical and mental health (US Centers for Disease Control and Prevention, 2015). Physical activity is an effective prevention and treatment strategy for adult obesity (Church et al., 2011). Additionally, self-management techniques were shown to have a positive effect on weight management (Ryan & Sawin, 2009). Successful treatment of obesity may improve self-image and social interactions and increase overall quality of life.

The current doctoral project describes an occupational therapy guided, health-promoting program for adolescents with LD or ADHD. The program aims to assist adolescents in becoming proactive participants in their health-related behavior change by teaching self-management skills and providing health-related information. The program incorporates the popular Zumba activity as a fun and engaging physical activity exercise

(Thompson, 2011; Vendramin et al., 2016).

Zumba (Zumba Fitness ®) is a Latin-inspired dance exercise program, which is generally practiced in groups. It combines Latin rhythms and aerobic steps, involves whole-body movements and a sort of choreography that is less formal than other group exercise classes (Luettgen, Foster, Doberstein, Mikat, & Porcari, 2012). Although it is a form of moderate-to-high exercise intensity workout, Zumba is often called "exercise in disguise" as it is easy to follow and stay engaged. Zumba classes form a total workout, combining all the elements of fitness; these include cardiorespiratory endurance, muscle conditioning, speed, balance, and flexibility, among others (Caspersen, Powell, & Christenson, 1985). Its benefits were demonstrated in a study involving female college students who participated in Zumba training twice a week over 8 weeks. The participants of the study showed notable improvements in well-being, body composition, aerobic fitness, trunk strength and dynamic balance (Donath, Roth, Hohn, Zahner, & Faude, 2014).

Participating in the suggested program, which incorporates the individual's personal preferences, circumstances, context and needs could result in increased motivation to keep a healthy lifestyle and thus participating in everyday life activities.

The program has five key features:

- **Occupation based:** Establishing health-promoting habits and routines at home and school.
- **Physical activity:** Adding weekly fun and engaging Zumba Fitness activities**.**
- **Health education:** Providing information regarding healthy lifestyle components.

- **Self-management:** Instilling self-regulation skills.
- **Family involvement:** Establishing family support for the participants.

These elements, as well as supporting evidence, evaluation plan and funding plan will be discussed in detail in the next chapters.

CHAPTER TWO – Project Theoretical and Evidence Base

Overview of the Problem and Theoretical Evidence

This chapter describes the theoretical framework supporting this doctoral project and summarizes previous attempts to address the problem in populations with similar attributes. The problem of overweight and obesity among adolescents with LD and ADHD has many aspects. In order to analyze the factors that contribute to the overall problem, the Individual and Family Self-Management Theory (IFSMT) (Ryan & Sawin, 2009) was chosen as a focusing lens. The theory assumes that managing risk factors can improve health outcomes by preventing, delaying, or attenuating health conditions. The framework suggests a new mid-range descriptive theory, integrating theory and empirical research that focuses on the individual, dyads within the family, or the family unit. This theory attends to the contextual factors known to affect self-management, the process of self-management, and proposes relationships among contextual and process dimensions (Figure 2.1). The types of situations that IFSMT is most appropriately applied to are individuals managing a chronic condition or risk factors (e.g. diabetes, asthma, etc.) or engaging in health promotion activities (Ryan & Sawin, 2009).

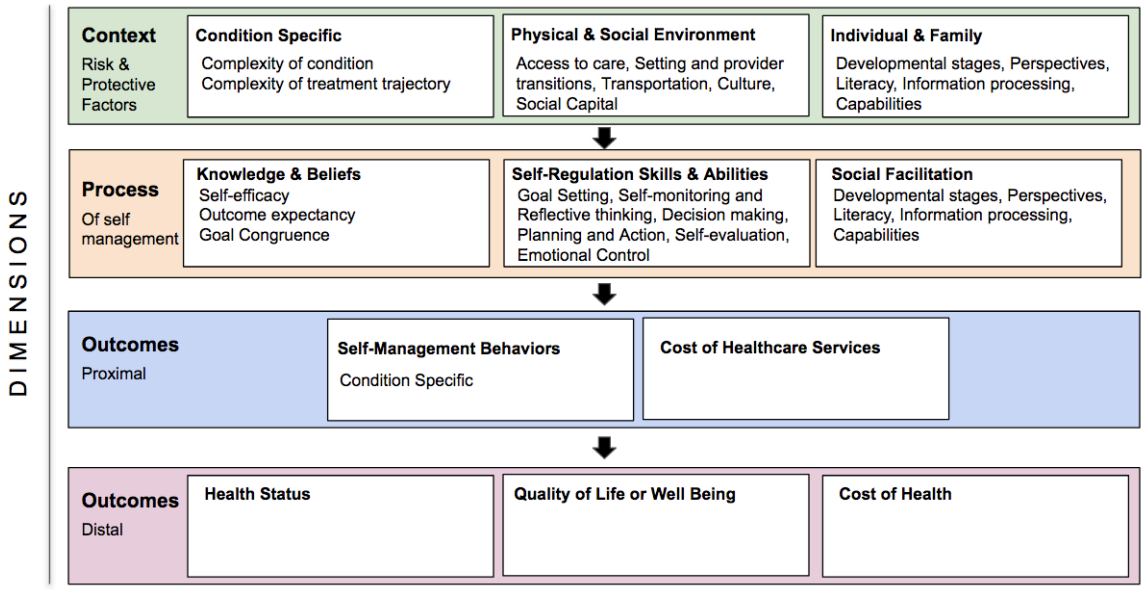


Figure 2.1: Model of the Individual and Family Self-Management Theory. Adapted from Ryan & Sawin (2009).

The Context Dimension of the IFSMT

There are several underlying causes for the problem of overweight and obesity among adolescents with LD and ADHD. In order to understand the interactions between the components that contribute to the problem, an explanatory model was created (Figure 2.2). The model draws upon the context dimension of the IFSMT and the person-environment-occupation model (Law et al., 1996) which forms the foundation of the occupational therapy practice framework. The proposed model corresponds with existing professional literature, which will be discussed later in this chapter.

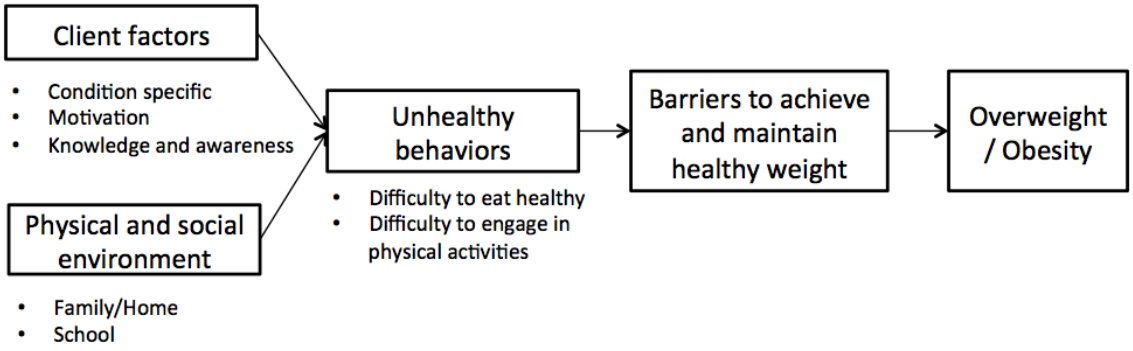


Figure 2.2: The explanatory model for the problem of overweight and obesity among adolescents with LD and ADHD.

The Occupational Therapy Practice Framework (OTPF) along with the IFSMT model were utilized in order to disentangle the factors contributing to the overall problem of overweight and obesity among adolescents with LD and ADHD. Occupational therapy seeks to support clients' participation in daily living that results from the dynamic intersection of clients, their desired engagements, and the context and environment (American Occupational Therapy Association, 2014; Law et al., 1996). Occupational therapists analyze client factors in order to design a meaningful intervention plan. Client factors are defined as specific capacities, characteristics, or beliefs that reside within the person and that influence performance in occupations. Client factors include values, beliefs, and spirituality; body functions; and body structures (American Occupational Therapy Association, 2014). The environments in which the client's daily life occupation occurs are the external physical and social conditions that surround the client. Finally, the variety of interrelated conditions within and surrounding the client, i.e., the context that influence performance, are taken into consideration in the intervention process. These

include cultural, personal, temporal, and virtual contexts.

The underlying causes for the problem of overweight and obesity among adolescents with LD and ADHD are defined within the Context dimension of the IFSMT. This dimension includes condition specific factors, as well as individual and family factors. Also found within this dimension is physical and social environment which corresponds with the environment aspect of the person-environment-occupation model. Client factors, as defined by OTPF, may be discussed within the scope of the "condition specific" and the "individual and family" bins in the IFSMT model.

The factors that were identified as major contributors to the difficulties of maintaining a healthy weight and engaging in healthy behaviors among youth with LD and ADHD were categorized as either condition specific, motivation, or related to knowledge and awareness. Further breakdown of each of these factors and support from the literature are discussed in the following sections of this chapter.

ADHD, Addiction Disorder, and Obesity

Children with ADHD were found to be significantly more likely to develop substance abuse/dependence compared to children without ADHD (Lee, Humphreys, Flory, Liu, & Glass, 2011) . The ADHD–obesity association was argued to be essentially a variant of the ADHD–drug abuse comorbidity (Davis, 2010). Thus it is suggested that obesity is the consequence of addiction. Davis also suggests that children with ADHD are characterized by the diminished ability to exhibit restraint when this is the most favorable and socially appropriate response in a particular situation. Moreover, children with ADHD have an enhanced tendency to approach and engage in rewarding and pleasurable

stimuli (e.g., consuming high sugar content foods), as well as to respond impulsively without an appropriately adaptive concern for the future consequences of their actions. Another important aspect is that a western diet contains high levels of fat, sugar, and caffeine, all of which has a drug effect as well as causing overweight.

Medication

Symptoms of ADHD are commonly treated by medication. While usually, these medications are considered to be safe and effective (Brown, Samuel, & Patel, 2018), they may have side effects affecting weight management. In a study involving children and adolescents with ADHD, it was found that they have increased odds of being at risk for overweight (Waring & Lapane, 2008). The same study found that youth with ADHD, not currently medicated, had 1.5 times the odds of being overweight, and those currently medicated had 1.6 times the odds of being underweight compared to youth without ADHD. Another interesting finding of that study was that children and adolescents with ADHD were 9 times as likely to report depression/anxiety as those without ADHD.

The impact of psychostimulant treatment was not consistent across studies as to its effect on obesity, with some studies showing a significant reduction of the rates of obesity in individuals treated with psychostimulants, and others not confirming such a finding. One of the studies reviewed by Cortese and Tessari (2017) was conducted by Levy, Fleming, & Klar (2009), who reported that appetite reduction was evident in the first 4–6 weeks of treatment. However, this effect diminished and even vanished in most subjects within two months.

Eating Habits

People with ADHD may show irregular eating habits resulting in weight gain. In a review article covering eight independent studies, the authors conclude that ADHD fosters binge eating behaviors (Cortese, Bernardina, & Mouren, 2007). Moreover, the authors suggest that ADHD and binge eating are the expression of a common neurobiological dysfunction that manifests itself as comorbidity in a subset of patients. They also suggest that binge eating contributes to ADHD symptoms and conclude that there is emerging evidence that binge eating or eating disorders with binge eating behaviors (such as binge eating disorder or bulimia nervosa) occur at higher than expected rates in subjects with ADHD. An updated meta-analysis covering 41 studies found meta-analytic evidence of a significant association between ADHD and obesity, regardless of possible confounding factors such as psychiatric comorbidities (Cortese & Tessari, 2017).

ADHD symptoms were significantly associated with overeating as well as objective binge eating, which is defined as consuming excessive calories in a single binging episode due to loss of control. However, ADHD symptoms were not associated with subjective binge eating, which occurs with people who perceive themselves as extreme binge eaters but do actually consume an exaggerated amount of calories (Egbert et al., 2018). In a research conducted by Steadman and Knouse (2016) the relationship between ADHD and binge eating was examined, as both were previously found to correlate with impulsivity. The study concluded that although impulsivity may play an important role in the interrelationship of ADHD and binge eating, other factors might

also be critical in the development of this comorbidity.

Sedentary Behavior and Reduced Levels of Physical Activity Among LD, ADHD

The World Health Organization (WHO) recommends that children and youth ages 5 to 17, should engage daily in at least 60 minutes of moderate- to vigorous-intensity physical activity to ensure healthy development. However, physical activity levels are decreasing among young people in countries worldwide. This decline is mainly due to the increasing sedentary way of life (World Health Organization, 2010). The association between abnormal hyperactivity/inattention and sedentary behavior was tested in a cross-sectional study at 24 primary schools in the United Kingdoms (McWilliams, Sayal, & Glazebrook, 2013). The results of the study suggest a significant association between teacher-rated abnormal hyperactivity/inattention scores and sedentary behavior regardless of gender. In the study by Cook, Li, & Heinrich, (2015), the authors found that youth with LD were significantly more likely to exceed recommended levels of sedentary behavior. Furthermore, youth with LD only, ADHD only, and comorbid LD and ADHD were significantly less likely to meet recommended levels of physical activity. Decreased physical activity or increased sedentary behavior (e.g., watching TV), in individuals with ADHD, was documented as a possible mechanism favoring abnormal weight gain associated with ADHD (Cortese & Tessari, 2017).

Awareness

Lack of awareness of the importance of healthy choices may lead to difficulty in maintaining a healthy weight and to acquiring harmful behaviors. In a study conducted among urban youth in Georgia, the participants commonly recognized obesity as a

problem, but there was less understanding of the link to lifestyle choices or the connection to future morbidities (Sylvetsky et al., 2013). The findings suggest a need to educate youth as to the relationship between lifestyle behaviors to the development of obesity.

Parents awareness of their child's health status, eating and drinking habits as well as their activity levels, may have an important role in shaping their health-related choices. It was found that parents of overweight children tend to underestimate the weight status of their children, compared to parents of children with normal weight (Nemecek, Sebelefsky, Woditschka, & Voitl, 2017). Such misperception is likely to lead to decreased motivation to address and change childhood obesity (Lundahl, Kidwell, & Nelson, 2014).

Motivation

The person's level of motivation to engage in health-promoting behaviors is of substantial importance when considering participating in a new health-related activity. While adolescents with LD and ADHD may not necessarily have motivation levels lower than in the average population, increasing the motivation would support adopting a healthy lifestyle. While information about self efficacy of adolescents with LD and ADHD in the context of engaging in health-promoting behaviors was not found, a study by Major, Martinussen, & Wiener (2013) show that perceptions of competence on tasks related to self-regulated learning may be low in individuals with ADHD. It is therefore suggested that self-efficacy of individuals with ADHD might also be lower in other daily life aspects such as health-related activity.

Environment

According to the OTPF, environment is defined as external physical and social conditions that surround the client and in which the client's daily life occupations occur (American Occupational Therapy Association, 2014). These include both physical and social environments. The physical environment may include the individual's house or apartment, school facilities, and means of transportation. The social environment includes significant relationships between individuals and other persons or groups. The social environment also includes availability and expectations of significant individuals and systems (e.g. education system) that influence norms, role expectations and social routines. Personal efforts to engage in healthy behaviors are often hindered by social factors incompatible with health such as neighborhoods unsafe for exercise, peer-group norms related to food choices and alcohol, and expectations inherent in some family traditions (Institute of Medicine (U.S.), 2001; "Lack of Physical Activity | CDC," 2019). A previous study has shown that youth with ADHD are more likely to have low socioeconomic status (Waring & Lapane, 2008). Such financial constraints often lead to consumption of low-cost, unhealthy processed food (Neumark-Sztainer, Story, Resnick, & Blum, 1996; Wang, 2001), and inadequate resources at school or lack of suitable or accessible sports facilities could result in fewer physical education hours each week (McKenzie & Lounsbery, 2009).

For youth, the school environment is the main setting at which they spend most of their time. It is also the educational entity, other than their families, that is expected to guide them to embrace healthy life habits. In the United States, the state or county

authorities determine the number of weekly hours of physical education and physical activity provided at schools. Nearly all states (50) have set standards for physical education programs. However, only Oregon and the District of Columbia meet the national recommendations for the weekly time in physical education at both elementary and middle school levels (Society of Health and Physical Educators, 2016). On average, 24% of students in member countries of the Organization for Economic Co-operation and Development (OECD) report that they attend physical education classes 3 days or more per week (OECD, 2017). In the United States, this number is higher, reaching 50.2%. However, 41% of the students report that they do not attend physical education classes at all, compared to only 6.9% of students in the OECD average. Students in Israel were found to be below the OECD average. Most students (47%) reported that they attend physical education classes only twice a week, and 26% reported attending only one class a week. Almost ten percent (9.4%) of students reported not attending any physical education classes at school.

Summary of Causes

All the above-mentioned factors may contribute to engaging in unhealthy behaviors such as a sedentary lifestyle, an abnormal eating pattern (e.g. binge eating), addictive behavior, or lack of engagement in physical activities. These behaviors pose a barrier to achieving and maintaining a healthy weight and eventually may lead to overweight and obesity. It should be noted that in some of the mentioned studies, ADHD condition was not diagnosed by a health professional but instead assessed by a questionnaire given to teachers, and also that the age of the studied population did not

always fully overlap with the intended age group for the proposed program.

Previous Attempts to Address the Problem

Interventions for students with learning disabilities (LD) and attention-deficit/hyperactivity disorder (ADHD) often address improvement of academic and behavioral performance (Chu & Reynolds, 2007; Spitzer, Parham, Mailloux, & Huecker, 1998). Recent studies show that this population is prone to physical inactivity, excessive sedentary habits, and unhealthy eating behaviors which may lead to overweight, obesity, and poor health outcomes (Agranat‐Meged et al., 2005; Cook et al., 2015). However, health practitioners and educational teams do not commonly address these behaviors and habits. It is essential to recognize that every occupation of childhood is affected by obesity, including occupational engagement and participation. Therefore it is suggested that occupational therapists should take a substantial role in addressing healthy weight management and healthy lifestyle choices to help manage and prevent overweight in children and youth with LD and ADHD (Pizzi, 2016; Reingold & Jordan, 2013).

Physical activity

Physical activity is known to have the potential to improve many aspects of people's lives, such as health, engagement in positive occupations, and social interactions. A review of literature has found that structured physical activity is a potentially effective treatment for some ADHD symptoms in children (Halperin, Berwid, & O'Neill, 2014). It is also likely that children who exercise will experience improved health, self-confidence, self-esteem, and positive peer relationships (Slutzky & Simpkins, 2009). Moreover, children who engage in aerobic activities with peers are likely to foster healthy lifestyle

habits that are counter to substance use, and in the case of ADHD might lead to reducing the reliance on medication (Halperin et al., 2014). A recent study involving 2,680 college students investigated the influence of exercise on diets, found that a longer **duration** of exercise is associated with decreased preferences for western diet and snacking patterns (Joo, Williamson, Vazquez, Fernandez, & Bray, 2019). Moreover, a higher **intensity** of exercise was linked to an increased preference for the prudent pattern, described as frequent consumption of fruits, vegetables, and low-fat foods, as well as lower intake of fried foods, and soft drinks. A **higher dose** of exercises, which was measured by heart rate physical activity score (HRPAS) and adjusts exercise duration in minutes by exercise intensity, was associated with a decreased preference for the snacking pattern and an increased preference for the prudent pattern. The study shows that exercising three days a week for 15 weeks appears to motivate young adults to pursue healthier dietary preferences and to regulate their food intake. It should be noted that the subjects of this study were healthy, independent individuals, who were older than the target population for the suggested program.

Daily physical activity was also tested as a measure for addressing weight management in primary school students. In a random-controlled trial, Dwyer, Connan, Leitch, Hetzel and Baghurst (1983) administered a 14-week, 1.25 daily-hour fitness program to more than 500 children. Their findings suggest that children who participated in the fitness group experienced a significant gain in physical work capacity (Withers, Davies, & Crouch, 1977) and showed a significant decrease in body fat compared to the less intense fitness and control groups. It was also found that there was no decrease in

plasma cholesterol, triglycerides, and HDL cholesterol. The study focused on physical activity and did not address other components of a healthy lifestyle such as a balanced diet and health-promoting behaviors. It could be that additional educational activities addressing these concerns would have gained a larger impact on the health parameters that were measured.

Education

Educational and community-based programs promote and enhance health and wellness by educating communities on topics such as nutrition, physical activity, obesity prevention among others ("Educational and Community-Based Programs | Healthy People 2020," n.d.). Several studies have shown that focusing on educational efforts can change and improve health behavior. A large randomized controlled field trial evaluated the impact of classroom lessons addressing components of health behavior (Gortmaker et al., 1999). The study, involving 1,295 ethnically diverse grade 6 and 7 students, was conducted during two school years. The intervention covered four major subjects: decreasing television viewing time, decreasing consumption of high-fat foods, increasing fruit and vegetable intake, and increasing moderate and vigorous physical activity. The sessions were delivered within existing curricula using pre-trained classroom teachers and a variety of student-centered teaching methods to engage students, including demonstrations, debates, case studies, group projects, games, and student presentations. The intervention reduced television hours among both girls and boys and increased fruit and vegetable consumption. While the prevalence of obesity among girls in intervention schools was reduced compared with controls, no difference was observed among boys. In

another study, children in an elementary school received an 18 lesson, 6-month classroom curriculum to reduce television and video game use (Robinson, 1999). The Body Mass Index (BMI), triceps skinfold thickness, waist circumference, and waist to hip ratio were significantly decreased in the intervention group. Intervention group changes were accompanied by significant decreases in children's reported television viewing and meals eaten in front of the television. Applying an educational program focusing on decreasing consumption of carbonated drinks had a similar positive effect in reducing the number of overweight or obese children, 7–11 years old compared to the control group (James, Thomas, Cavan, & Kerr, 2004). The children participating in the one-year program were given fruits to learn about the sweetness of natural products. Additionally, art and music activities were used in order to deliver the message to the children in a fun and engaging way. For example, a tooth immersed in a sweetened carbonated cola to was shown to the class to demonstrate its effect on teeth health. These studies show that education efforts, even without additional extra-curricular physical activity component, had a beneficial effect on health behavior and even BMI in some cases.

Education and Physical Activity

While physical activity programs and educational efforts individually show promising results in improving healthy lifestyle among children and youth, a combination of both approaches might have a more profound effect. Mcmurray et al. (2002) tested this hypothesis by providing school children with either exercise only, education only, or exercise and education combined interventions for eight weeks. The exercise-only group received 30 minutes of aerobic exercise three days a week while the education-only

group received a “knowledge program” that was developed by a state-certified health educator and taught by the regular classroom teacher twice a week. The combined intervention group received both the exercise and knowledge programs. The results of the study suggest that increasing the aerobic component of a physical education class for as little as eight weeks can reduce the age-related increase in blood pressure that normally occurs during early adolescence. While the combination of an educational intervention and an exercise program may have the greatest positive impact on blood pressure and skinfolds, exercise appears to be the more important determinant. However, the long-term effect of the educational component was not tested.

Another example of a school-based program testing the effect of combining health education and aerobic activity on student level of fitness was delivered to African American and Hispanic adolescents from a low-income background (Flores, 1995). A moderate to high-intensity aerobic dance activity replaced regular physical education classes and was taught for 50 minutes, three times a week during the 12 weeks of the intervention. Students were encouraged to suggest music for these classes. A culturally sensitive health education curriculum was delivered twice a week covering the following topics: nutrition, exercise, obesity and unhealthy weight regulation practices, smoking prevention, substance abuse, stress management, and peer pressure. The dance program was found to be associated with a significant decrease in BMI and heart rate (HR) for girls compared to a control group. A similar improvement was not observed for the boys group, possibly due to their preference for free playtime rather than structured classes.

Providing physical activity time and educational curriculum to instill healthy

lifestyle habits and improve fitness parameters for children and adolescents has shown encouraging results. Moreover, parental involvement and emphasizing the importance of healthy food consumption have also been tested in combination with the former components. In a 6-month program conducted in a school environment, children ages 6-14 received an educational curriculum introducing them to healthy food choices (Kain et al., 2004). Additionally, the parents were presented with the guidelines of healthy eating, and obesity prevention. Positive reinforcement was given to children who ate healthy snacks during daily recess. An extra 90 minutes of physical activity were delivered each week, and music was played at recess time to encourage the children to be active (e.g., dance, play Ping-Pong, basketball or volleyball). The program was implemented and evaluated by a trained nutritionist and physical education teacher. The measured physical fitness parameters (i.e., aerobic endurance and flexibility of the lower back) improved significantly in both boys and girls compared to the control group, while a positive effect on adiposity indices was observed only in boys.

Occupation-Based Interventions

Professionals from multiple disciplines are addressing the issue of health management for children and youth. These include educational staff, nutritionists, and occupational therapists among others. The goal of occupation-based practice is to improve the satisfaction and capacity of individuals and groups for engaging in desired or expected occupations where and when they naturally occur. Such engagement positively influences overall health and quality of life. The American Occupational Therapy Association reported that various occupational therapy interventions could be effective in

the area of weight management for children (Reingold & Jordan, 2013). For example, occupational therapy interventions for childhood obesity may prevent delays in motor development and adverse psychosocial influences, as well as the range of additional health problems caused by adult obesity (Hong et al., 2016). Therefore, occupational therapists should play a pivotal role in formulating physical activity programs addressing health management and wellbeing. They can provide meaningful, client-centered, effective interventions that would motivate clients' participation in order to modify daily life habits, roles, and patterns. Occupational therapy interventions in the area of obesity may include but are not limited to community programs of health promotion through lifestyle change, education programs, facilitating the development of new habits and routines, wellness programs for children, teens, and adults, as well as play and physical education in the schools (Salles-Jordan, 2007).

A small-scale community-based study explored the impact of an occupational therapy wellness program on daily habits and routines of children ages 9–10 years old (Kugel, Hemberger, Krpalek, & Javaherian-Dysinger, 2016). Children and their parents were interviewed and information about daily routines and activities was collected. Each participant and parent engaged in a semi-structured interview and completed the Pizzi Healthy Weight Management Assessment© (PHWMA). The PHWMA is an inter-professional assessment that is used to examine the impact of obesity in daily skill engagement for children and their families. The assessment is based on the stages of change theory and serves as a clinical tool for facilitating occupation-centered behavior changes for youth and their families for the treatment and prevention of obesity. The

most common areas that both youth and parents sought to change were time spent participating in play, fun and leisure activities, as well as reducing time spent watching television. The data were used to design the six-week occupation-based program and served as a baseline. The program addressed daily routines, time management, fun exercise activities, nutrition, and sedentary behavior. Every session included aerobic warm-up and cool-down yoga, as well as a healthy snack. The students were engaged by using discussions, group brainstorming, craft activities, and visual aids. Each session was concluded with a group wrap-up and reflecting on what was learned. Children were encouraged to prepare healthy snacks at home using a healthy recipe card-box, which they made during program sessions. The program was found to help youth and their parents to be more mindful of their daily activities and make health-related behavior changes. The results of the study also suggest that parents and children have different priorities as to which category of activity should be modified in order to increase engagement in healthy behavior. Therefore, practitioners should consider the goals and motivations of both parties to support a family-centered approach.

Similar to the program of Kugel et. al., (2016), another after-school program was designed by occupational therapists to promote a healthy lifestyle among children (Lau, Stevens, & Jia, 2013). However, while Kugel et. al.'s health promotion program addressed medium to high socioeconomic status schools, Lau et. al. have designed an occupation-based program for children from low social-economic status. Lau et al.'s program was based on the principles of building self-efficacy focusing on the individual's motivation, goals, routines, habits, and environments. It aimed to increase children's

experiences with physical activity and healthy foods to promote their sense of self-efficacy related to a healthy lifestyle. The program was delivered twice a week, over a 12-week period. Within the intervention session, the children participated in fun fitness activities (e.g., obstacle course, jump rope and dancing) for 30–45 min. This was followed up by a short discussion about the qualities of physical activities, personal preferences for activities, and how to increase physical activity and decrease screen time within their daily routines. An important element of the intervention was to empower the children to make individual healthy food choices within their daily routine. The children would set weekly healthy choice goals with the guidance of an interventionist, regarding healthy eating and physical exercise. Efforts were made to engage the parents to support physical activity, reducing screen time, and improving healthy nutrition choices. To support change in the home environment, children consistently brought helpful handouts and sample prepackaged healthy snacks to the parents. The results of the study demonstrated positive changes in food behavior, self-efficacy pertaining to food, and vegetable consumption. There was no significant change in BMI, potentially because the BMI of the participants was within the healthy range at the beginning of the program. It should be noted that 15 out of the 30 participants had to quit the program due to financial difficulties, stressing the importance of a financially accessible intervention for low socio-economic groups.

Discussion

Overall, intervention programs concerning health promotion for children and youth followed similar objectives. These include encouraging physical activities,

choosing healthy food and preparation of healthy snacks, reducing screen time, and involvement of parents and family in the intervention process. The methodology of most programs followed similar lines such as using visual aids, games, and engaging activities. However, the length of the intervention, number of sessions and duration of each meeting varied considerably, from 5 weeks (Mcmurray et al., 2002) to a full school year (Gortmaker et al., 1999; James et al., 2004), ranging from one (Kugel et al., 2016) to three (Flores, 1995) sessions a week. Only in one case did the participants take part in setting personal goals (Lau et al., 2013). The most common results of the reviewed interventions were an improvement in healthy eating habits, decrease in weight or BMI, and improved fitness, as expressed by blood pressure or endurance tests. A reduction in screen time was also reported as a result of two interventions (Gortmaker et al., 1999; Robinson, 1999).

The variability in the results of the studies could be due to differences in intervention objectives and measures, sample sizes (from thousands of participants to only nine), and length of intervention. A ceiling effect was discussed as a variable that could affect the results of the studies. In one case, the children who participated in the study did not have enough unstructured time in order to add physical activities or reduce sedentary time (Kugel et al., 2016). In the other, the participants had a healthy BMI at the beginning of the study and therefore could not show a significant improvement of this variable (Lau et al., 2013).

The age of the participants should also be considered when measuring the effect size of the intervention. Childhood and adolescence are accompanied by physical growth,

which affects the amount of adipose tissue (Kain et al., 2004). This change is gender-specific and affects BMI as well as skinfold test result. Another variable that is affected by adolescence is blood pressure, which naturally increases during puberty (Mcmurray et al., 2002). It is therefore important to consider these issues when choosing the measures for evaluating the results of the intervention.

Occupation based programs often encompass the individual, occupational and environmental aspects (Law et al., 1996). Therefore interventions for the prevention of childhood overweight and obesity address daily habits, physical education, physical activity, and family involvement in a school or community environment. Only a few occupation-based intervention programs concerning weight management for children are published let alone interventions addressing youth with LD and/or ADHD. Therefore, the proposed intervention program targets this gap by providing evidence-based, multi-faceted health-promoting program for youth with LD and/or ADHD and their families. Several factors were identified as relevant to forming a successful intervention program. Education addressing components of physical activity, nutrition, daily routines, time management, and sedentary behavior seemed to be an effective method to improve habits and routines. Increasing the frequency, duration, and intensity of physical activity showed a positive outcome. Additionally, family involvement was found to have a meaningful impact on the continuation of the learning process outside the program's setting. Using engaging visual aids and fun activities assisted in delivering the materials to the participants. It is also suggested that using a semi-structured interview as well as both the caregiver and youth versions of the PHWMA could assist to design an occupation-led

intervention.

CHAPTER THREE – Description of the Program

The Keep Moving! program is an OT led, occupation-based program designed to address the needs of adolescents with LD and ADHD who are at risk for occupational performance difficulties due to inactivity and weight gain. The program assumes a preventative intervention approach, which according to the occupational therapy practice framework (OTPF) is intended to address the needs of clients with or without disability who are at risk for occupational performance problems (American Occupational Therapy Association, 2014). Occupation-based practice aims to improve the satisfaction and capacity of individuals and groups to engage in desired or expected occupations where and when they naturally occur. Such engagement positively influences overall health and quality of life. According to the OTPF, practitioners direct their interventions toward current or potential disabling conditions with the goal of enhancing the health, well-being, and participation of all group members collectively (American Occupational Therapy Association, 2014). Often, interventions focus on health promotion activities, educational services, environmental modification, and self-management. Self-management refers to the use of self-regulation skills to manage chronic conditions or risk factors.

From a literature review of intervention programs addressing children's and youth's physical activity and education towards a healthy lifestyle, several factors relevant to forming a successful intervention program were identified. Education addressing key components of physical activity, nutrition, daily routines, time management, and sedentary behavior were found to be an effective method to improve

habits and routines. Instilling self-regulation skills, as these stand in the base of self-management, showed promising outcomes regarding eating habits and self-efficacy. Increasing the frequency, duration, and intensity of physical activity also had a positive outcome. Additionally, family involvement was found to have a meaningful impact on the continuation of the learning process outside the program's setting. Using engaging visual aids, and fun activities assisted in delivering the materials to the participants.

The proposed program aims to promote positive health behaviors for youth at risk for overweight and obesity at the school, community and home environment. The context dimension of the IFSMT model, which was discussed in chapter 2, was used to identify the key components of the problem. The second dimension, named Process of Self-management is guiding the planning and implementation of the program. This dimension contains three elements: "Knowledge and beliefs," "Self-regulation," and "Social facilitation." Each of these elements is addressed with an actionable content.

The first element, "Knowledge and beliefs," encompasses factual information and perceptions about a health condition or health behavior. Information regarding the effects and consequences of overweight, the benefits of physical activity, and how to make healthier choices will be delivered to the participants. During personal meetings with participants, the OT will explore issues related to self-efficacy, outcome expectancy, and expectations congruence.

The second element, "Self-regulation," is defined as an engaging iterative process that is required in order to achieve a change in health behaviors. Self-regulation includes activities such as goal-setting; self-monitoring and reflective thinking; decision-making;

planning for and engaging in specific behaviors; self-evaluation; and management of physical, emotional and cognitive responses associated with health behavior change. In the course of the program, tools for engaging in self-regulation activities will be demonstrated along with personal guidance on how to implement them.

The last element is "Social facilitation," which occurs within relationships and enhances an individual's capacity to change. It involves the concepts of social influence, social support, and negotiated collaboration between individuals and families and healthcare professionals. Social influence is a message or dialogue in which respected persons in positions of perceived authority advises and encourages individuals and families to engage in specific health behaviors. The respected persons may be health professionals, family, friends, neighbors, or media celebrities. Social support consists of emotional, instrumental, or informational guidance provided to a person or family. School staff and health professionals, as respected persons in positions of perceived authority with expert knowledge, will be involved the progress of the program by participating in delivering the educational group sessions. Social influence can also be achieved by involving figures that are influential (famous celebrities, leaders etc.) to the individuals in the program. Social support from peers will be gained by conducting group activities, while support from family members will be added by asking for their cooperation, and suggesting methods in which they may assist in improving the health-related routines at home.

The Keep Moving! program encourages health related behavioral change, and as such, it incorporates elements from the Transtheoretical Model (TTM) that was designed

to be a model for supporting behavioral change (Burbank & Riebe, 2001). The TTM was formulated by Prochaska et al., (1982) who have identified five stages in the process of change: pre-contemplation, contemplation, preparation, action and maintenance stages. The model assesses the readiness of a person to change and provides a time dimension for an individual's behavior change process (Prochaska & DiClemente, 1982; Vilela, Jungerman, Laranjeira, & Callaghan, 2009). The TTM is a non-linear model (Figure 3.1) that helps practitioners to understand how change occurs and how best to facilitate it (Stephenson, Laverdure, Seruya, & Cosbey, 2017). In the context of school-based interventions, TTM offers occupational therapy practitioners options for implementing effective strategies to support behavior changes (Stephenson et al., 2017). The model is frequently used for weight management programs, and it has been widely used in weight loss management in designing lifestyle modification strategies (Wu & Chu, 2015).

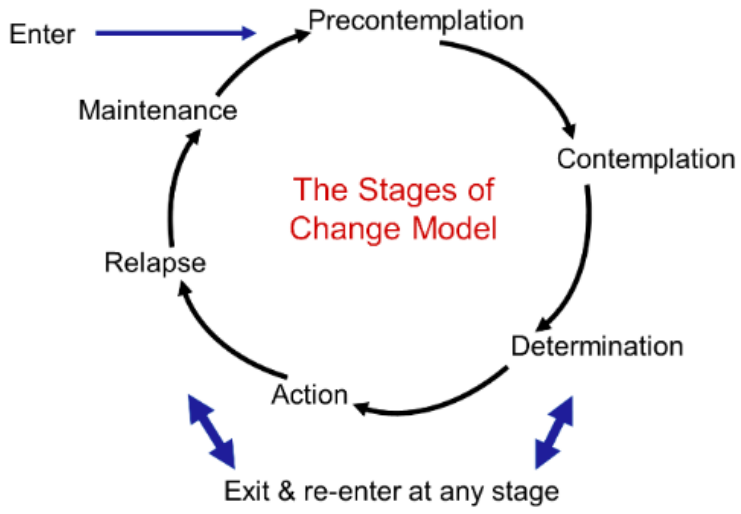


Figure 3.1: The Stages of Change model (LaMorte, 2019).

An occupation-based intervention addressing weight management could be assisted by using the Pizzi Healthy Weight Management Assessment (PHWMA), which draws from the stages of change theory (Kugel et al., 2016). The PHWMA is an occupation-centered assessment that considers self-reflection, goal attainment, and self-efficacy, and their role in weight management (Kuo, Pizzi, Chang, Koning, & Fredrick, 2016). It examines occupational participation in the context of weight management and a healthy lifestyle. The PHWMA identifies the individual's readiness to change in regards to the process of behavioral change and is intended to help OT professionals to promote engagement in healthy weight management, and health promotion interventions. Once the stage of readiness to change is identified for each participant, the OT may apply specific motivational strategies to support further advancement. Example strategies are given in Table 3.1.

Table 3.1
Examples for motivational strategies for each stage of change.

Stages of change	***Suggested Strategies***	***Ideas for approaching and engagement***
Pre-contemplation Individuals are not willing to change within the next six months. While some could refuse to change, others may wish to achieve it at some point in the future, though not within the next six months.	• Build therapeutic relationship. • Establish trust and rapport. • Remain non-judgmental and patient. • Provide information about the option to make a change. • Help student identify personal priorities and lifestyle goals.	• "Tell me about your typical day" (habits and routines, activities) • "Tell me about your experience with physical activities"
Contemplation Individuals are thinking about changing their target-behavior within the next six months, and are keen to receive information about their problem.	• Assist the individual to explore the options and weigh the relative pros and cons of behavioral change. • Model and discuss what the possible changes may look like. • Support decision-making.	• "I'd love to talk with you about some different options". • Provide information about healthy behaviors, and healthy choices. • "Let me show you the type of benefits a healthy behavior can produce".
Preparation Characterized by a commitment towards the change, possibly within the next few months. Generally, individuals at this phase have already tried changing their dysfunctional behavior before, or they have been making efforts to prepare for change.	• Offer practical support and help establishing timelines.	• Offer ways to be more physically active in leisure time and throughout the day. • Propose instruments that may assist in the health change process (such as time management techniques, nutrition and activity logs). • Suggest physical activities that are within reach.
Action Individuals have put their attempts to change into	• Provide support and positive reinforcement. Provide information about	• Provide positive feedback and rewards.

practice. At this stage, the risk of relapsing is high, since individuals are engaged in new activities and behaviors. Hence, they need to pay a great deal of attention in order to avoid falling back into their old unhealthy habits.	social and medical resources that facilitate change. • Teach self-management strategies to prevent relapse.	• Suggest ways to support the engagement in physical activities and choose healthy food, for example: ○ By accountability – schedule to work out with a friend or a family member. ○ By preparation – have sportswear and shoes readily available.
Maintenance Individuals have changed their behavior for at least six months. At this stage, the change has become a part of their life and they are less likely to relapse than in the previous stages, although relapse prevention is still advisable.	• Continue to provide support and positive reinforcement. • Prevent relapse and encourage long-term change.	• Provide positive feedback and rewards. • Review skills for managing situations that may trigger relapse. • Suggest ways to add novelty to routines, such as new exercises, new workout clothing, new healthy recipes, introducing new healthy foods, and find new workout companions.

Note: Definitions for the stages of change were suggested by Ceccarini et al. (2015). Strategies were adopted from Stephenson et al. (2017), and Curtis (1998).

Unlike the IFSMT, the TTM does not explore the interactions between the individual and social groups. Therefore the theory and model will guide the intervention process and provide support for the individual who is undergoing the process of change. While the TTM will help indicate at which stage of readiness to change the individual is, elements from the IFSMT will guide the process of managing the risk factors that influence health outcomes.

Key features of the program

The program has five key features, which are:

Occupation based: Establishing health-promoting habits and routines at home and school.

Physical activity: Adding weekly fun and engaging Zumba Fitness activities**.**

Health education: Providing information regarding healthy lifestyle components.

Self-management: Instilling self-regulation skills.

Family involvement: Establishing family support for the participants.

Target population

Recipients: Adolescents with LD and ADHD ages 14–18 years old.

Criteria for inclusion: Willingness of caregivers and adolescents to participate in the program, formal diagnosis of LD and ADHD, physician's approval for participation in aerobic exercise, caregiver's consent.

Criteria for exclusion: Injury or disability preventing participation in physical activities such as Zumba Fitness.

Process of delivery

Setting: Special education class or school, or community center.

Duration: Twelve-week program. Each week includes two 45 minutes Zumba Fitness activities, and one 45 minutes self-management and informative health education sessions. Three 1-hour informative health education meetings with the parents will be given throughout the program.

Group size: 10–14 participants, in accordance with the special education class size in Israel.

The timeline of the program is given in Figure 3.2. Gathering referrals from teachers and staff at a school or community center will take place one month prior to the commencement of the program. This step will be followed by approaching parents, delivering an introductory meeting showcasing the program, gathering consents and asking for their collaboration. One week prior to the commencement of the intervention, an OT who will also lead the intervention process will conduct a personal meeting with the participants, discuss outcomes expectations, and deliver the baseline evaluation. At this time, fitness watches will be handed to each participant.

The intervention process will take place over the following 12 weeks, and will include two physical activities and one educational session each week. Informative sessions for caregivers will take place in weeks 1 and 6 of the program. A concluding caregivers group meeting will take place during the last week of the program. In the last week of the intervention program, a final evaluation will be delivered by the occupational therapist. The evaluation will survey the progress of each participant and will include a recommendation for future intervention as needed.

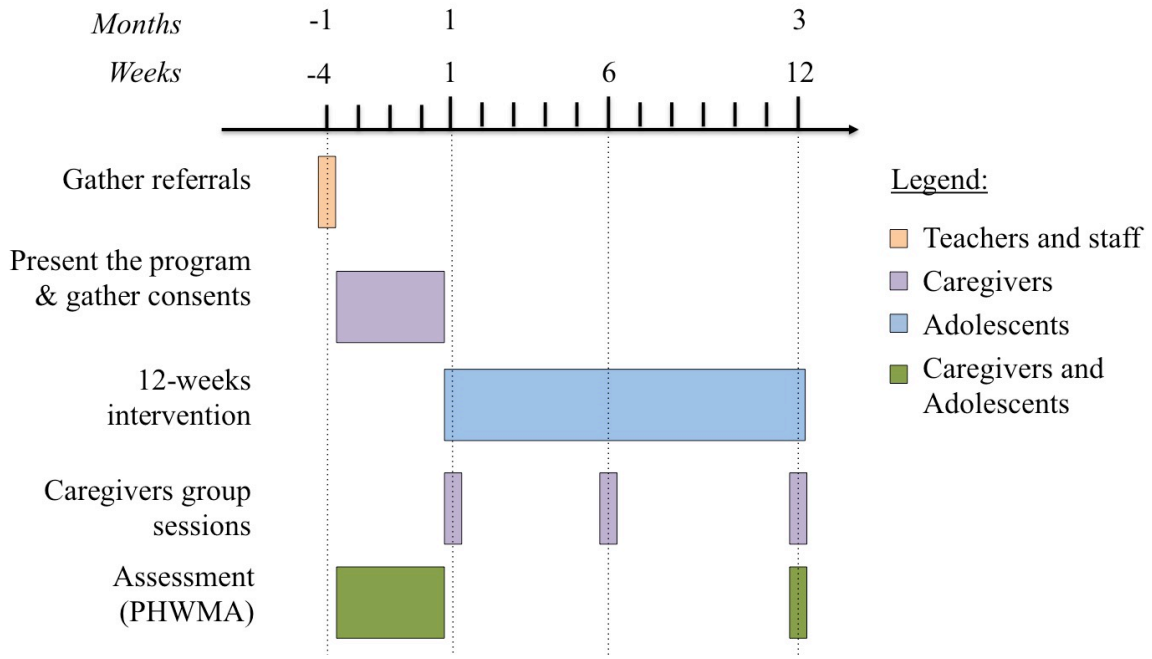


Figure 3.2: Program timeline.

Structure of main program activities

Structure of Zumba session

Total duration: 45 minutes each

- Warm-up - 10 minutes
- Zumba interval workout and activities - 30 minutes
- Cool-down - 5 minutes

Structure of educational session for adolescent participants

Total duration: 45 minutes each

- Stretching and body movement - 3 minutes
- Interactive educational activity - 15 minutes

- Stretching and body movement - 3 minutes
- Interactive educational activity - 15 minutes
- Summary - 8 minutes

Subjects to be covered:

- Physical fitness and its impact on physical and mental health as well as school performance.
- Introducing The Transtheoretical Model (Stages of Change).
- Setting personal goals and achieving them.
- Sedentary behavior, screen time, and implications.
- Healthy vs. unhealthy diet and portion control.
- Making healthy choices in various scenarios (holiday meals, vacations, parties, etc.).
- Health self-management and time management.
- Preparation of healthy snacks and food.

Structure of informative session for caregivers:

Total duration: 60 minutes each

- Stretching and body movement - 3 minutes
- Interactive informative activity - 30 minutes
- Stretching and body movement - 2 minutes
- Interactive informative activity - 20 minutes
- Summary - 5 minutes

Subjects to be covered:

- Why individuals with ADHD and LD are finding it hard to maintain a healthy weight.
- Physical fitness and its impact on physical and mental health as well as school performance.
- Sedentary behavior, screen time, and implications.
- Healthy food choices.
- Preparation of healthy snacks and meals.
- Health management and time management.

Evaluation activities

1. Prior to the first week of the program, semi-structured interviews including the PHWMA questionnaire for both adolescents and caregivers, will be conducted to determine a baseline and assess to what extent the parents wish to make a change in each category related to healthy weight management.
2. Prior to the first week of the program, students will be given the youth version of the PHWMA to determine a baseline and assess to what extent the student wishes to make a change in each category related to healthy weight management.
3. Physical measures - Height, weight, blood pressure, heart rate at rest, and average daily number of steps will be measured starting at the first week of the program. Fitness watches will be provided a week prior to the starting date of the program for a continuous measurement.

4. In the last week of the program (12th week), semi-structured interviews including the PHWMA questionnaire for both adolescents and caregivers will be conducted.
5. Physical measures - Height, weight, blood pressure, heart rate at rest, daily average number of steps will be measured in the last week of the program

Personnel

Occupational therapy practitioner will lead the program, deliver assessments and interviews, and deliver educational sessions and parental meetings. The OT will monitor and evaluate the program, coordinate the program's personnel, and consult the Zumba instructor on the specific needs of individual participants and the group as a whole.

Zumba Fitness instructor will plan and deliver Zumba Fitness classes following the Zumba Fitness manuals and in consultation with the leading occupational therapist to account for specific needs of the participants and the group as a whole.

Nutritionist (Consultant) will consult the occupational therapist regarding healthy diet components, design healthy recipes that will be prepared during informative sessions, and assist in preparing informative handouts for students and parents.

Intended Outcome

Short-Term Outcomes

- Participants will demonstrate increased awareness of healthy lifestyle components and benefits.
- Participants will plan for engagement in healthy behaviors related to healthy eating and physical activity, using self-management skills such as goal setting, self-reflection, and self-monitoring, and time management techniques.

- Participants will show increased engagement in healthy behaviors related to healthy eating and physical activity.
- Participants will express satisfaction from participating in the program.
- Students will maintain a BMI equal or lower to their baseline BMI.
- Caregivers will demonstrate increased awareness and knowledge about healthy lifestyle components and its benefits.

Intermediate Outcomes (Three months post-program)

- Students will maintain increased engagement in weekly physical activity compared to baseline.
- Students will maintain a balanced diet.
- Students will maintain a BMI equal or lower to their baseline BMI.

Long-Term Outcomes (One year post-program)

- Students will take a proactive role in managing their health-related behavior
- Students will maintain a BMI equal or lower to their baseline BMI.

Potential barriers and challenges for implementation

The potential barriers and challenges that were identified for implementing the Keep Moving! program are described in table 3.2.

Table 3.2
Potential barriers and challenges for implementation.

Potential barriers	**Methods of addressing the barrier**
Recruit a school or community center that will be willing to host the program.	1. Promote the program with school district managers at the Ministry of Education. 2. Promote the program with the education departments in multiple municipalities.
Allocate time during school hours to deliver the program.	1. Discuss the allocation of periods with school headmaster and administrators in order to fit the program within the school's schedule.
Raise the necessary funds to implement the program.	1. Contact non-profits addressing youth with LD and ADHD 2. Reduce costs by involving an occupational therapist already employed by the school
A low motivation of parents and students to participate in a health promotion program.	1. Inform parents about the benefits of the program during the initial parents' group meeting, as well as by providing informative handouts and 1-on-1 meetings or phone calls. 2. Encourage students to become proactive participants in their self-management process
Lack of interest of male students to participate in a Zumba Fitness activity.	1. Invite those who are reluctant to participate to try at least one Zumba Fitness activity. 2. Hold a fun Zumba Fitness active break event for the whole school or an afternoon Zumba event for the community.

Examples for program sessions for students

Zumba Fitness session

Fun and energy-packed Zumba Fitness session designed specifically for adolescents with LD, ADHD, is based on the Zumba kids and Zumba kids Jr. manual. A child's/ adolescent's body is still developing muscles, bones, tendons, ligaments, and other physical components. The goal is to teach the concept that a healthy lifestyle at a young age can promote continued good health and to use Zumba classes as an exciting method to meet that goal. The goal is not to become an expert dancer, or to move as fast and far as possible.

Notes to the instructor:

1. The goals of the Zumba Kids classes are to develop a healthy lifestyle and to incorporate fitness as a natural part of children's lives.
2. When teaching, do not focus on the physical activity aspect as much as the "fun" aspect to participants engaged.
3. While physical activity is an important element of children and adolescent development, Zumba also considers other facets, including:

- Leadership
- Respect
- Team Work
- Pride, Confidence and Self Esteem
- Memory and Sequencing
- Creativity and Imagination
- Coordination and Balance
- Spatial Awareness

4. Be aware of other benefits of participating in Zumba activities which include:

- Making friends and spending time with friends.

• Learning and honing new skills.

• Opportunity for students to experience an activity that is different from day-to-day school curriculum.

• Opportunity to be competitive.

5. Be especially careful discussing body image. Adolescents at this age may be sensitive about their appearance and how others perceive it.
6. Be aware of your choice of clothing. Wear your clothing in a conservative fashion.
7. Allow participants to move naturally, never forced.
8. Use positive reinforcement. For example, instead of saying, “Stop moving your hips so much”, reinforce what you want to see, such as “let me see strong arms and muscles”.
9. Key concepts for Modifications from Zumba adults’ class - Some modifications are required to adapt Zumba movements to be age and environment appropriate.
    - Replace “passionate” movements with age appropriate ones.
    - Modify moves that include pelvic contractions so that you are not forcibly moving pelvis. Replace the pelvic and abdominal contraction by bending/bouncing with the knees and emphasizing arm movement. Do not lock the hips and pelvis, they will move naturally as you bend your knees.
    - Modify movements that contain hip circles so that hips move laterally side to side.

Table 3.3
Examples for Zumba class structure.

Time	Segment	Description and notes
10 minutes	**Welcome** (3 minutes) Say a warm and friendly hello as they arrive.	• Use names. • Announcements and updates if there are any.
	Warm-Up (7 minutes) Simple and fun movements. Include some basic skipping, hopping, and light jumping.	Purpose of the warm-up: • To gradually increase heart rate • To do rhythmic limbering • To prep joints and muscles • To show preview of moves to come
30 minutes	**Follow Along** (10 minutes) Two songs	• Movements/choreography should be simple, fun and easy to follow. • Use mostly non-verbal cueing, but add verbal cues when needed, so that students would feel successful.
	Rhythm Review (8 minutes) Deliver a basic type of step for this section	Examples for basic type of steps: • *Cumbia* rhythm from Columbia • *Merengue* step from the Dominican Republic • *Flamenco* moves from Spain • *Quebradita* move originated in Mexico, using maracas. • Create a *rain dance* of Native American tribes. • *Hula* from Hawaii, possibly while wearing Leis.
	Water break (5 minutes)	• Make sure drinking water is available. • Keep note of time.
	Game (7 minutes) The purposes of this section: • Provides a change of pace during the session to successfully keep their attention. This is ideal for a shorter attention span. • Provides an opportunity to	Choose one game: • **Bust a Move!** Form a circle or a straight line. Take turns and have each person come to the middle of the circle or to the front of the line and lead a dance move of his or her choice. All others follow the leader. • **Memory Dance** Form a circle. One participant does one simple move. Next student repeats first move and adds a second move. Next participant repeats first 2

	demonstrate leadership. • Teaches respect for others— take turns with their peers. • Creates an opportunity for fun and playful physical activity. • Lets them explore their creativity and imagination.	moves and add a third move, and so on. See how far around the circle you get before someone misses a move. • **Dance Battle** Split the group in two. Have each group face the other. One participant leads one of the groups with a move while heading towards the other group. At a designated distance, e.g. 5' from the other group, the group will turn around and skip back to their original spot. Repeat with the other side. Continue back and forth switching leaders each time. Note: For all activities, you may want to lead the first moves until participants have a repertoire of moves, which they can use.
5 minutes	**Cool Down** (4 minutes)	Use long, simple stretches.
	Closing (1 minutes) Thank and reward all students with a "Great Job!" or personalized praise to each participant as they leave.	•You may gather a circle (like a football huddle) with a positive chant at the end, e.g., "1..2..3..We Rock!" or another slogan the participants will suggest.

Example for Educational session

Key points to consider when delivering educational sessions to adolescents with LD and ADHD:

- Use audiovisual materials, for example movies, PowerPoint presentations etc.
- Use follow-up directions:
  - Oral directions: After giving directions to the class, ask if the directions were understood. Repeat and clarify as needed.
  - Provide additional oral directions for participants who need assistance.

- Written directions: Provide follow-up directions in writing on whiteboard. Remind the participants to look at the whiteboard if he or she forgets the assignment.

- Lower noise level: Monitor the noise level in the classroom, and provide corrective feedback, as needed. If the noise level exceeds the level appropriate for the type of session, remind all students, or individual students, about the behavioral rules they have in class.
- Divide work into smaller units: Break down assignments into smaller, less complex tasks.
- Highlight key points: Highlight key words in the instructions on worksheets to help the focus on the directions. Prepare the worksheet before the lesson begins.
- Use cooperative learning strategies: Have students work together in small groups to maximize learning experience. Use strategies such as "Think-Pair-Share" where educators present a topic for each student to think about, students are paired with partners to discuss it. Last, students are asked to share their thoughts and ideas with the group (Schul, 2011).
- Use assistive technology: For example, Kahoot! app.

Topic: Time management for healthier daily schedule

Goal: Participants will gain a sense of control of their time and will find time balance

Objectives: By the end of this session, each of the students would be able to:

1. *Define* what is a "time-waster activity" in their daily schedule.
2. *Identify* sedentary activities throughout their daily schedule.
3. *Identify* times of engaging in physical activity in their daily schedule.

4. *Suggest* more than one strategy how to reduce time wasters in their daily schedule.
5. *Identify* time for engaging in physical activity in their daily schedule.

Table 3.4
Examples for educational class structure.

Time	Segment	Activity description	Notes
4 minutes	**Welcome** Time Management session "How does time management affect my health"	• Present today's session, topic, goals, and structure. • Stretching and body movement. You may use a short group game.	• Be predictable, provide session structure and be consistent between classes. • Generating blood flow will improve later attention.
15 minutes	**Interactive educational activity**	• Participants will be handed an empty daily schedule and will be asked to fill in their typical weekday activities. • Ask participants to mark sedentary activities in red, and non-sedentary activities in green. Use Think-Pair-Share strategy. • Lead a discussion about the how much time is spent for each type of activity, and is it optimal, and what are "time-wasters". • Brain storming on how to add non-sedentary activities to our daily schedule.	• Use visuals. • Prepare empty daily schedules in advance.
3 minutes	**Break - Stretching and moving**	Stretching and body movement game to generate blood flow.	
15 minutes	**Interactive educational activity**	"Big Picture" puzzle challenge: • Divide your group into teams. Give each team a puzzle with similar level of difficulty but do not give them the "Big Picture" of what it will look like when completed.	

		• Instruct the teams to complete the puzzle as quickly as possible. • Interrupt the process after ~3 minutes and ask, "What is missing? What makes the task difficult?" It is likely they will identify the absence of the final "Big Picture" to use as a guide as the limiting factor. • After you give them the "big picture", ask them to complete the puzzle. They will do this much faster now. • Summary - Explain that having the perspective and clarity of the "Big Picture" helps one to plan ahead. This projects onto weekly and day-to-day time planning. If we miss the overall "Big Picture" then time is spent on urgencies, time-wasters, and distractors.	
8 minutes	**Summary**	• Ask "What are you taking with you from today's session?" • Lead the participants towards the following topics: 1. Strategies to reduce time-wasting activities. 2. Planning daily and weekly activities, and emphasize adding physical activities (e.g. walking to school instead of taking the bus). • Introduce the topic of the next session.	Summary discussions could be done while passing a ball, or in a circle.

CHAPTER FOUR – Evaluation Plan

Practice Scenario

Dana is a 15-year-old diagnosed with LD and ADD. She attends the 9th grade in a special education school in Israel. Dana does not like to spend much time in class, but she does love playing videogames and play apps and chat on her smartphone. During a school week, she is expected to attend 2 hours of physical education classes, but she tries to avoid attendance as much as she can. At home, her family does not gather for dinner, rather each member of the family eats at his own time, usually while watching television. While lunch is provided at school, Dana usually buys extra snacks such as chocolate bars and chips at the grocery store near the school. When she is doing her homework, Dana finds it more useful to concentrate while snacking.

This scenario is not unique; many adolescents diagnosed with LD and ADHD tend to have unhealthy eating habits, resulting in weight gain (Cortese et al., 2007). Moreover, these adolescents are less likely to meet recommended levels of physical activity and may exceed recommended levels of sedentary behavior (Cook et al., 2015).

Vision

The Keep Moving! health promotion program aims to promote healthy lifestyle and wellbeing among adolescents diagnosed with LD and ADHD who are at risk for engaging in unhealthy behaviors and experience overweight issues. The accessible intervention program incorporates health self-management techniques and Zumba fitness exercise and is intended to take place at schools and community centers in Israel. The program combines five key elements are (1) Occupation based Establishing health-

promoting habits and routines at home and school (2) Physical activity: Adding weekly fun and engaging Zumba fitness activities (3) Health education: Providing information about how to manage a healthy lifestyle. (4) Self-management: Instilling health-related self-regulation skills. (5) Family involvement: Establishing family support for the participants.

The program evaluation will utilize both formative and summative evaluation approaches. The program manager will examine the effectiveness of the program in instilling healthy behavior related knowledge, self-management skills, and willingness to participate in physical activity. Participants and their caregivers' level of satisfaction will also be recorded and analyzed.

Evaluability Assessment

The evaluability assessment process will commence at least two months prior to initiation of the program. Primary stakeholders will include the program developer, program staff, comprised of the OT, Zumba instructor, nutritionist consultant, and school or community center management. Organizational stakeholders and representatives of funding agencies namely the Ministries of Health and Education will be invited to attend. Other invited participants will include Zumba Fitness company representative, as well as potential participants and their caregivers who are likely to provide significant input.

The process will start with presentation of the vision and goals of the program, followed by the strategic plan of the program and its logic model (Figure 4.1) accompanied by supporting research and theories. The layout of the program in terms of duration, number of meetings, and the structure of each meeting will be discussed, as

well as expected expenses and how the suggested budget will address these. Stakeholders will be asked to present their perspectives and list their priorities for the evaluation process, and the results they would like to gain from it. The plausibility of the evaluation program will be discussed and agreement will be sought. The evaluation program and its implementation will be modified according to suggestions. Last, future use of data that will be collected will be agreed upon.

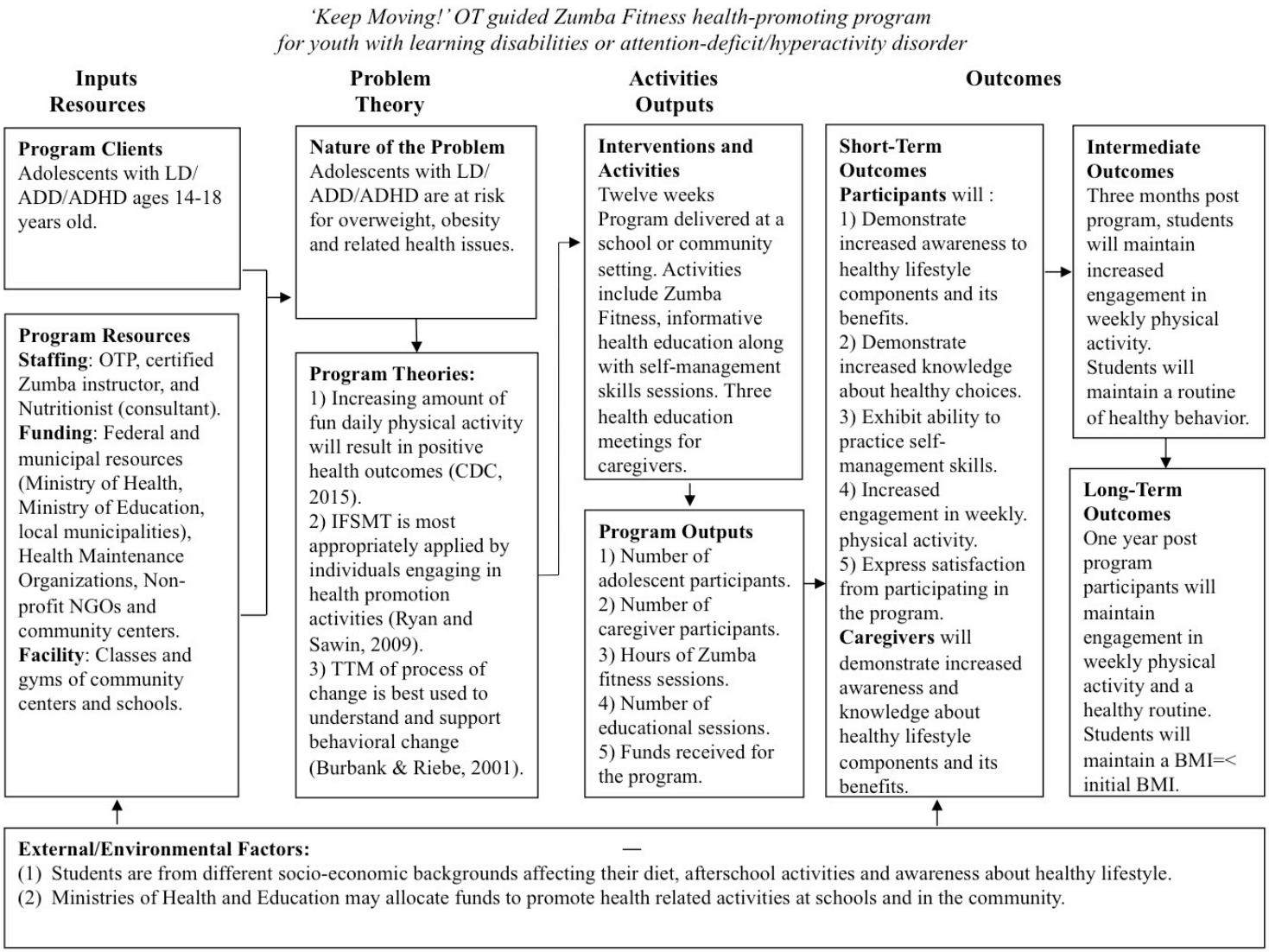


Figure 4.1: Logic model for the Keep Moving! program.

Core Purposes of the Evaluation Plan

The evaluation program will be based on two core purposes. The first is to establish a causative relationship between the Keep Moving! program activities and readiness for a behavioral change, improvement in health-related lifestyle, and improvement in health parameters of the participants. The program manager will use a pre-post repeat measurement design to follow the progress of each participant. Using this approach will minimize biases due to the small group size and variability among participants. Appropriate statistical tests such as paired sample T-test will be used. The second core purpose is descriptive and will study the program's characteristics, such as participation, satisfaction, costs per session and so forth. Descriptive statistics will be used to assess these parameters.

Scope of the Evaluation

The program will include two groups of 10–14 participants, 20–28 participants in total. Inclusion criteria for the program are physician's authorization, caregiver's consent, and participant diagnosed with LD and ADHD age of 14–18 years old. Exclusion criteria for the program are a heart condition, asthma, and inability to perform stepping movements while standing. The option to recruit only female students will be discussed with stakeholders, as this might affect the participation in Zumba activities.

Qualitative assessment will be carried through semi-structured interviews of participants, caregivers, and staff. The evaluation will take place at four time points along the intervention program, namely at the beginning, after 6 weeks, on the last day of the program, and 12 months after the program ends. Data will be collected at a school or

community center by a trained external interviewer.

For quantitative assessment of physical activity, the number of steps and heart rate will be collected weekly for each participant using a fitness smart-watch (e.g., Fitbit). Blood pressure, weight, and height of each participant will be measured at the beginning and end of the program as well as 12 months after the program ends. Participation will be registered after each activity. The PHWMA questionnaire (Kugel et al., 2016) will be used to asses the participants' readiness to change, and the impact of weight on daily skill engagement will be administered to participants and caregivers at the beginning and end of the program. A student will be considered as present in an activity if he attends at least 2/3 of the class's time length. An outside observer who was trained for this purpose by the program leader will assess the quality of delivery of activities.

Evaluation Questions

The evaluation questions for this program will address key interest points of the program's stakeholders. The identified stakeholders are the program developer, caregivers, participants, school/community center management, funding agencies, and Zumba Fitness company representatives.

Program developer:

1. Is the duration of the program (12 weeks) enough to produce the desired changes?
2. Are the three weekly sessions enough to produce the desired outcome?
3. Is the Keep Moving! program generating the intended long-term results?
4. Is the Keep Moving! program more effective than other health promotion programs?

5. Is the current group session format meeting the participants' needs?

Caregivers:

1. Will the program help my child to make healthy choices and improve his overall health?
2. Did I gain practical knowledge on how to improve my family's health?

Participants:

1. Is there a health benefit from participating in the program?
2. Will the program teach me about healthy behaviors?
3. Will I enjoy the activities of the program?
4. Will I be able to implement the skills and knowledge I have gained, after the program ends?

School/community center management:

1. Is the program well received by the community?
2. Are the participants reacting well to the activities in the program?
3. Is the program time and cost effective?

Funding agencies:

1. Will the requested funding cover the costs of the program?
2. Would the outcomes justify the costs (cost-effectiveness)?

Zumba Fitness company representatives:

1. Is Zumba Fitness an effective type of exercise for the specific demographic group?

Research Design and Methodology

For the quantitative portion of the study the program developer will use a quasi-experimental, single group, pre and post repeat measurement design. Each participant will serve as his or her own control. Independent variables include the number of Zumba Fitness classes and educational classes attended, body mass index (BMI), and the results of the PHWMA at the starting time point of the program. Dependent variable parameters that will be collected weekly will include daily activity monitoring, comprised of number of steps and heart rate at rest using fitness smart-watch. Generally, a lower heart rate at rest implies more efficient heart function and better cardiovascular fitness (Jensen, Suadicani, Hein, & Gyntelberg, 2013). Additionally, the end-of-program PHWMA results will be recorded in the last week of the program.

Qualitative information regarding expectations from the program will be assessed by a semi-structured interview in the first week of the program. The satisfaction of participants and caregivers will be assessed by questionnaires and semi-structured interviews in the middle and at the end of the program, as well as 12 months after the program ends. An external observer who will be trained by the program coordinator will assess quality of delivery in each activity. Quality of delivery will be assessed by the following criteria: adherence to the curriculum, instructor's engagement (attentiveness, enthusiasm, seriousness, clarity, positivity), and student engagement (attention, participation) (Pettigrew et al., 2015). Data will be collected and recorded throughout the duration of the program as well as 12 months after the end of the program (Figure 4.2). The data will be inserted into an online Google Form and automatically backed-up

online.

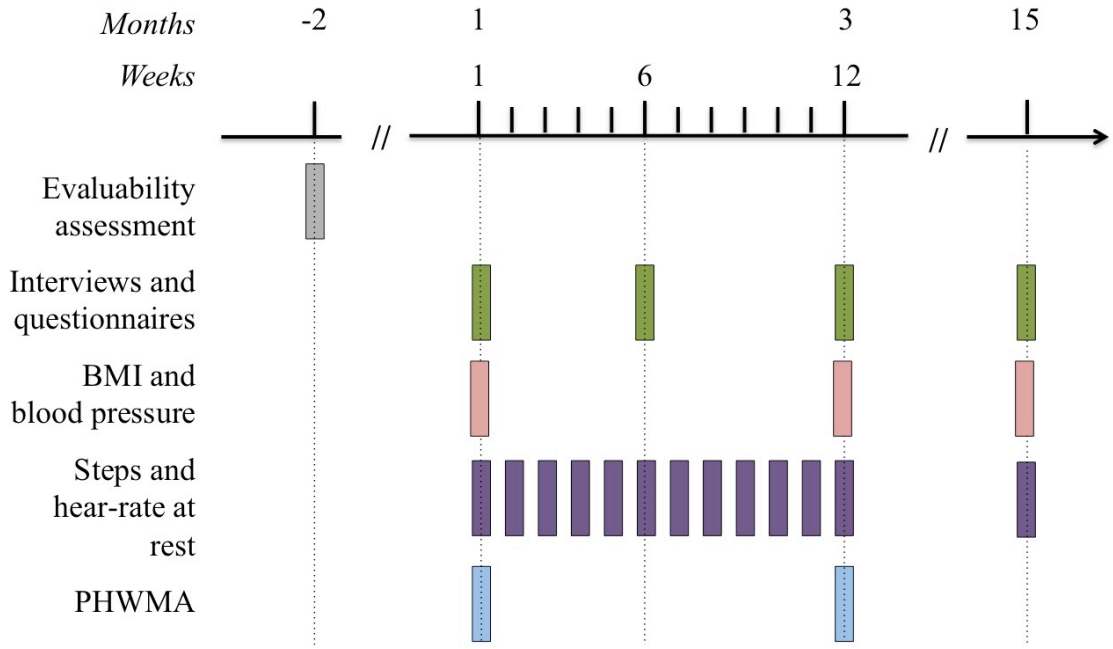


Figure 4.2: Timeline for evaluation activities. The program starts on week 1 of the timeline.

Planned Approach To Data Gathering

Each participant will be given a fitness smart-watch one week prior to beginning of the program. The program manager will retrieve the daily average number of steps and heart rate at rest from each smart-watch at the end of each week. Since there is no centralized computerized record system implemented in schools in Israel, all questionnaires and observation forms will be prepared in advance using Google Forms and their output will be stored in Google Sheets, thus utilizing online cloud storage. The program manager will deliver questionnaires at four time points, and the PHWMA will be delivered to participants and caregivers at the beginning and end of the program (Figure 4.2). Assistance with filling the questionnaires will be provided by the program manager by request from the participant. Body Mass Index (BMI) and blood pressure will

be recorded at the same day and immediately after participants attend the start, end and 12 moths post-program interviews. The results of these measurements will be collected into a Google Form at the time of measurement.

Data Analysis and Reporting

Quantitative data will be analyzed using relevant statistical tests in SPSS. Whenever possible, pre-post paired tests will be used. Qualitative data will be compiled and analyzed to identify themes and develop interpretative scheme. Analysis will be done using either QSR International's NVivo 11 Software (Richards, 1999), or a dedicated open-source R statistical program package named R package for Qualitative Data Analysis (RQDA) (Ronggui, 2016).

An executive summary as well as a full technical report will be produced within two months from the end date of the program. The executive summary will be provided to all stakeholders. A full technical report will be made available to stakeholders that will be interested in reviewing the results of the study. Specialists in the fields of physical activity and weight management will also review the technical report for adolescents. The report will be updated three months after the analysis of data that will be collected a year after the program ends.

Data Management and Logistics

The program manager, prior to the program commencement, will purchase fitness smart-watches. These devices will measure heart rate at rest as well as steps as a proxy for daily physical activity. Blood pressure at rest will be measured by an electronic blood pressure monitor that will be purchased by the program manager. Height and weight of

each participant will be measured using a measuring tape and scales that are available at the school or community center. All files and data will remain confidential throughout the program. All data will be stored at a cloud computing storage space (e.g. Google Drive), which provides integration with Google Sheets and Google Forms as well as automatic backup service.

CHAPTER FIVE – Funding Plan

Description of the program

Keep Moving! is a 12-week intervention program which provides an approachable and attractive Zumba fitness program to help youth with learning disabilities (LD) or attention deficit hyperactivity disorder (ADHD) to engage in physical activity and make healthier choices. The program is led by an occupational therapist and intended to be delivered in a school or community center environment while involving the students' families. The program will expose students to the benefits of Zumba fitness as a fun and effective physical activity. Moreover, it will provide the students with techniques for improving their self health-management. The program's vision is to implement healthy habits and routines, as well as raise awareness for an active lifestyle and its benefits.

Two-year budget

Two interventions will be delivered consecutively in the first year. In the second year, two interventions will be delivered concurrently, followed by another round of two more interventions, for a total of four groups in that year. The predicted costs for each fiscal year are given in Table 5.1.

Available local resources

- Healthy snacks might be provided by local merchants that would agree to support the initiative. These may include supermarkets and restaurants, and the school cafeteria.

- Some special education classes and schools in Israel are accompanied by occupational therapy practitioners who may coordinate and deliver the program without additional costs.
- Gym space in community centers will be requested to be made available free of charge or partially subsidized as a service to the community.

Table 5.1

Predicted costs in US$ for fiscal years 1 and 2.

Fiscal Year		1	2
Groups per year		2	4
Fixed costs			
Rental of facility	Community center space rental *	$1200	$1200
Advertising	Marketing and advertising	$300	$300
Consultants	Nutritionist	$1000	$1000
Dissemination	See Chapter 6	$100	$3600
Varying costs per group			
Salaries	Occupational therapist *	$2000	$2000
	Zumba instructor	$1200	$1200
Equipment	Fitness watches	$200	$200
Materials preparation	Prints	$200	$200
	Materials for healthy snacks prep.	$50	$50
One time costs			
Equipment	Sound system *	$250	
Total cost		$10,150	$20,700
Cost per participant	Assuming 14 participants in each program	$362	$369

Note. Asterisk denotes expenses that may not be required, depending on availability or presence at the school or community center.

Potential Funding sources

There are multiple potential funding sources on local and federal levels as well as through corporate and non-profit agencies.

Federal and municipal

- "Efshary Barie" (literally translated as "healthy is possible"), is the National Program for an Active and Healthy Life ("Efshary Barie—The national program for a healthy and active life," n.d.). It is a multi-agency program supported by the ministry of health, ministry of education and ministry of culture and sports. This program supports community programs for promoting a healthy lifestyle. Every municipality in Israel may submit a proposal that will be funded by "Efshary Barie" up to $100K. The grant is then divided among municipal programs.

Corporate

- Food industry companies (e.g., Strauss Israel) who would like to support healthy food consumption, which they manufacture, and sell.
- Fitness watch brands that may donate or subsidize some of the costs of fitness watches and use this opportunity to increase exposure for their products within schools.

Health Maintenance Organizations (HMO)

- The four HMOs operating in Israel are Clalit, Maccabi, Leumit, and Meuhedet. These organizations provide healthcare and offer health promotion programs to their members. As major stakeholders in public health and reducing costs of overweight related conditions, the HMOs may potentially be interested in financially supporting local health promotion programs.

Non-profits

- Nitzan-Israel, the Israeli Association for Children and Adults with Learning Disabilities, is the leading organization in Israel for people with LD and attention deficits. Nitzan is the only non-profit organization with 35 branches in Israel, providing professional assessment and other services for this population ("Nitzan the Israeli Association for Children and Adults with Learning Disabilities," n.d.).
- The Israeli Association for Public Health. Founded more than 40 years ago by the Ministry of Health, the association provides community-level prevention and treatment services, promoting community and individual health. It places an emphasis on education for children and adults for a healthy lifestyle ("The Society for Public Health," n.d.).

Conclusion

The Keep Moving! is an occupational therapist led program, which combines self-management techniques and Zumba dance activity. The program address adolescents with LD and ADHD who are at risk for overweight and obesity. Participants will establish healthy behaviors, which will promote a healthy life style and assist in reducing health related costs.

The current funding plan describes the anticipated annual costs for the first two fiscal years (FY) of the Keep Moving! program. The expected expenses FY1 and FY2 are $10150 and $20700, respectively. The plan also identifies potential sources of funding at the federal and municipal levels as well as from corporate, HMOs and non-profit NGOs.

CHAPTER SIX – Dissemination Plan

Description of the program

The *'Keep Moving!'* program is dedicated to improve overall health and decrease the risk of being overweight among adolescents diagnosed with Learning disabilities (LD) and Attention-deficit / hyperactivity disorder (ADHD). It is a 12-week program delivered in a school setting or community center. In order to help adolescents become more physically active and make healthier choices, the program combines accessible and effective Zumba Fitness sessions along with interactive, informative classes for students and parents. The program implements occupation-based intervention through obtaining healthy habits and routines, as well as help raise awareness for an active lifestyle.

Dissemination Goals

The goals of the dissemination plan is to convey the message that the Keep Moving! program is an effective mean to promote health among adolescents with LD and ADHD, and can also help in preventing health related complications due to overweight and obesity. The second goal is to raise awareness of policy makers at the government level to the importance of allocating resources to promote health education and physical activities for adolescents.

Long-Term Goal 1

Implement the Keep Moving! program in at least 3 municipalities within the next 2 years.

Short-Term Goals

1. Present the program to at least 6 district supervisors from the Ministry of

Education.

2. Present the program to education supervisors from at least 6 different municipalities.
3. Each year, implement at least one program in at least one additional municipality.

Long-Term Goal 2

Influencing government policy towards adding weekly physical activity and health education curriculum in middle schools and high schools.

Short-Term Goals

1. Presenting the program and its positive outcomes in a relevant Ministry of Health hearing committee.
2. Presenting the program and its positive outcomes in a relevant Ministry of Education hearing committee.

The primary audiences for disseminating the 'Keep Moving!' program are district supervisors from the Ministry of Education, school principals and community center managers. These are identified as key persons in their communities. They are leaders and decision-makers within the organizations that they manage. In many cases, they make the first level of executive management that can decide to adopt a community program without turning to higher-level management for authorization. Thus receiving their support is crucial for the efficient incorporation of the suggested program within schools and community centers.

Key messages

Several key messages were specifically formed to address district supervisors, school principals and community center managers as a way to best communicate the essential outcomes of the program.

Key messages for the primary audience**:**

1. Participants of the program became more physically active and less prone to being overweight.
2. Being physically active and engaging in a healthy lifestyle can improve the quality of life and wellbeing. It may also improve academic performance and social relationships.
3. The program features a low-cost intervention that can assist in reducing future health-related costs associated with un-healthy lifestyle and being overweight.

The following influential spokespersons may assist in spreading the key messages were identified:

1. Parents of adolescents with ADHD or LD who are actively involved in the community could serve as great advocators. Parents are often very persuasive and influential when it comes to promoting benefits for their children.
2. Healthcare professionals practitioners such as of occupational therapy, physical therapy, educational psychology and behavioral therapy working with adolescents with ADHD or LD at school and in the community. These professionals are in a position to recommend schools and community centers to adopt the program.

They can also understand and explain the benefits of participating in the program to community leaders as well as to parents.

The secondary audience is Israeli government agencies that may adjust policies to support programs aiming to improve the healthy lifestyle of the targeted population. These agencies may also provide financial support for the suggested program. Such agencies may include the division for special education within the Ministry of Education, and the National Program for an Active and Healthy Life, named "Efshary Barie" (literally translated as "healthy is possible"). The latter is a multi-agency program supported by the ministry of health, ministry of education and ministry of culture and sports.

There are three key messages for the secondary audience**.** They are**:**

1. The program improves health outcomes for the population of adolescents with LD and ADHD.
2. The program assists in reducing healthcare costs associated with a sedentary lifestyle and unhealthy eating behavior as well as improve the academic performance of the participants. It also assists adolescents to acquire healthy lifestyle habits and skills that would help them become productive members of their community.
3. The government agencies will choose to allocate resources for programs such as 'keep moving!'. The agencies will promote 'keep moving!' among schools and

community centers that they oversee.

The following influential spokespersons may assist in spreading the key messages were identified:

1. Healthcare professionals working with government agencies and healthcare providers that are interested in lowering the burden of costs of overweight and sedentary health-related issues.
2. The community of persons with learning disabilities and their families. This grassroots effort could raise awareness and apply pressure on government agencies to accommodate their needs.

Specific dissemination activities are planned in order to achieve the listed goals. Several tools and techniques are suggested for each activity, along with a proposed time frame. The activities are assigned to specific members of the program team and are presented in Table 6.1.

Table 6.1

Dissemination activity plan.

Activities	**Tools/techniques**	**Timing**	**Responsibilities**
Sharing the successful outcome of the 'keep moving!' program and its vision	Creating a Facebook page for the 'keep moving!' program	FY1, January	A certified OT who is the founder of the 'keep moving!' program
	Posting in Facebook communities of parents of children with ADHD and LD	Starting FY1, February	
	Posting in Facebook communities of healthcare professionals specializing in working with ADHD and LD students and parents	Starting FY1, February	
	An interview podcast which will present the importance and outcomes of the program. The podcast will be shared via social media	FY1, June	The founder, Zumba instructor, the consulting nutritionist, and parent of a student who participated in the program
Promoting the 'keep moving!' program with government agencies and community organizations	Personal meetings with key stakeholders such as parents, school principals, community center managers, and health professionals	Starting FY1, June	A certified OT who is the founder of the 'keep moving!' program
	Prepare and distribute informative brochures at social events in the community.	Starting FY1, June	Prepared by the founder of the 'keep moving!' program. Distributed by the program's staff
Promoting the 'keep moving!' program with health professionals	Present academic posters and deliver lectures about the importance and success of the program at professional conferences	Starting FY2, November	A certified OT who is the founder of the 'keep moving!' program
	Publish an article in relevant professional journals	FY2, June	A certified OT who is the founder of the 'keep

			moving!' program
Advocate for policy change towards improving health-related activities and education in schools	Publish a position paper stressing the need for and the benefits of adding weekly physical activity and health education curriculum in schools	FY2, June	
	Attend committee meetings at the Ministry of Health or Ministry of Education	FY2, October	

Note: The fiscal year (FY) begins in September, which corresponds with the opening of the school year in Israel.

The dissemination efforts that will lead to reaching the short term and long-term dissemination goals would require financial resources. The proposed budget for the first two fiscal years is provided in Table 6.2.

Table 6.2

Budget for a dissemination plan in US dollars.

Activity	FY1	FY2
Brochures	$100	$100
Conference registration fees		$1500
Journal publications fees		$2000
	$100	$3600

Evaluation

An evaluation of the dissemination plan will take place in July of the first fiscal year, six months after initiating the first dissemination activity, and every six months following that date. The founder of the program will evaluate the success of the dissemination plan. The first long-term goal, which is to implement the Keep Moving! program in at least 3 municipalities within the next 2 years will be assessed according to the measurable criteria of the short-term goals. These are to present the program to at least 6 district supervisors from the Ministry of Education as well to education supervisors from at least 6 different municipalities. Additionally, the program will be implemented in at least one additional municipality each year.

The second long-term goal of the dissemination plan is to influence government policy towards adding weekly physical activity and health education curriculum in middle schools and high schools. Its accomplishment will be evaluated according by successfully completing the short-term goals which are to present the program and its positive outcomes in at least one relevant Ministry of Health hearing committee, and in at least one relevant Ministry of Education hearing committee. Specifically, the dissemination effort will be towards committees addressing health promotion and the needs of children in risk of obesity and overweight. Another criterion is to publish at least one white paper stressing the need for and the benefits of adding weekly physical activity and health education curriculum in schools.

Conclusion

The dissemination plan was created in order to circulate the positive outcomes of the Keep Moving! program. The target audiences, which are addressed in the dissemination efforts, are district supervisors from the Ministry of Education, school principals and community center managers. Israeli government agencies that may adjust policies to support programs aiming to improve the healthy lifestyle of the targeted population will also be addressed.

Two long-term goals were formulated. Implementing the Keep Moving! program in at least 3 municipalities within the next 2 years and influencing government policy towards adding weekly physical activity and health education curriculum in middle schools and high schools. Several short-term goals supporting the long-term goals were also described. Community leaders, as well as health professionals, were identified as key stakeholders and will be approached by social media, white papers, brochures, personal meetings, and other measures. A budget for the first two years of the program was delineated and an appropriate evaluation plan was stated.

CHAPTER SEVEN - Conclusion

This doctoral project presents an occupational therapy guided program addressing adolescents with LD, ADHD at risk for overweight and obesity. The program is encouraging health-related behavioral change by instilling health-promoting habits and routines. It incorporates physical activity in the form of Zumba classes and educational sessions over 12-week period. The educational sessions include teaching self-management skills and providing health-related information. Caregivers are identified as influential figures in the life of the participants and encouraged to take part in the process of behavioral change.

The need for the suggested program was identified through reviewing the current literature, which revealed a gap in addressing the growing prevalence of overweight and obesity among adolescents diagnosed with LD or ADHD. The AOTA has declared that occupational therapy professionals should address pediatric and adult obesity across many settings (Cantal, 2019). While a number of occupation-based interventions were published, none were found to address the target population of this project.

There are many possible causing factors for overweight and obesity among adolescents diagnosed with LD or ADHD. Several of these factors could be addressed by an occupational therapy oriented intervention. These include sedentary behavior, low levels of physical activity and exercise, irregular eating habits, impulsiveness, and lack of awareness to the benefits of maintaining a healthy lifestyle, and constraints related to low socio-economic status.

Integration of Evidence

Weight management intervention programs were reviewed, and several themes were identified as most relevant to forming a successful intervention. Education addressing components of physical activity, nutrition, daily routines, time management, and sedentary behavior seemed to be an effective method to improve habits and routines. Increasing the frequency, duration, and intensity of physical activity showed a positive outcome. Additionally, family involvement was found to have a meaningful impact on the continuation of the learning process outside the program's setting. Making use of engaging visual aids and fun activities assisted in delivering the materials to the participants. It was also advised to apply both the caregiver and youth versions of the PHWMA, which will contribute to providing an occupation-focused intervention that takes into consideration the individuals' stage of readiness to change their health-behaviors.

Integration of Theory

The foundations of the program are based on two theories that assist in evaluating and supporting a health-behavior change and guiding the adolescents and their families in becoming proactive participants in their health self-management process. The Trans-Theoretical Model (TTM) of Behavioral change is used to identify the individual's readiness to change. It helps practitioners to understand how change occurs and how to best facilitate it. The Individual and Family Self-Management Theory (IFSMT) complements the TTM by providing a point of reference to analyze the components leading to the problem, and guide the process of managing the risk factors that influence

health outcomes.

Implications for Occupational Therapy

The program may have several implications for occupational therapy practice. Occupational justice is defined as recognizing and providing the occupational needs of persons and communities as part of fair and enabling society (Wilcock & Townsend, 2000). Being overweight or obese was found to prevent individuals from opportunities to engage in meaningful occupations. Promoting the development of healthy habits and routines could mitigate the risk of these conditions. The suggested program assists at-risk individuals to acquire those skills, which will enable them to participate in life occupations.

Occupational therapy practitioners provide services that are client-centered. The current program is further emphasizing this principle by instilling self-management skills in the target population. This approach enables the individuals to take a significant part in the process of managing their health. Introducing self-management techniques to individuals in varied settings may further promote the benefit that occupational therapy offers to clients, groups, and populations.

Only a few occupation-based intervention programs concerning weight management for children are published let alone interventions addressing youth with LD and/or ADHD. Therefore, the proposed intervention targets this gap by providing an evidence-based, multi-faceted health-promoting program for youth with LD and/or ADHD and their families. A similar program could be applied to other populations at risk for overweight and obesity with some adjustments. For example, the type of physical

activity could be modified to accommodate the abilities and interests of other at-risk population groups. Moreover, the program could be delivered in different settings, for example, workplace environments, assisted living communities, and rehabilitation day centers.

EXECUTIVE SUMMARY

‘Keep Moving!’ - Occupational Therapy Guided Health-Promoting Zumba Program for Adolescents With Learning Disabilities or Attention-Deficit/Hyperactivity Disorder

Background

Overweight And Obesity – A Global Pandemic

Obesity is one of the most significant risk factors for physical and psychological health problems, such as metabolic disorders, Type 2 diabetes, colon cancer, cardiovascular disease, depression, and mortality (Faith, Matz, & Jorge, 2002; World Health Organization, 2016). More than one-third of children in the United States are overweight or obese, and rates have increased in recent years, making obesity a public health concern (Ogden, Carroll, Kit, & Flegal, 2014). Children who are obese may face social stigmatization and discrimination (Kuczmarski, Reitz, & Pizzi, 2010; Puhl & Heuer, 2010; Scaffa, Reitz, & Pizzi, 2010), and they may experience reduced opportunities for social participation and engaging in play at their home and school (Lane & Bundy, 2012; Pizzi & Vroman, 2013).

ADHD and LD – Population At Risk

One in every five children in the USA has a learning and attention issues (“The State of LD,” n.d.), and an estimated 8.4 percent of children and 2.5 percent of adults have ADHD (Danielson et al., 2018; Simon, Czobor, Bálint, Mészáros, & Bitter, 2009). The current body of research has established a significant association between ADHD and obesity (Cortese & Tessari, 2017). People with ADHD may show irregular eating habits such as binge eating resulting in weight gain (Cortese, Bernardina, & Mouren, 2007).

Moreover, Youth with LD are significantly more likely to exceed recommended levels of sedentary behavior and are less likely to meet recommended levels of physical activity (Cook, Li, & Heinrich, 2015).

The ADHD–obesity association was argued to be essentially a variant of the previously known association between ADHD and drug abuse (Davis, 2010). Western diet contains high levels of fat, sugar, and caffeine, all of which has a drug-like effect and contribute to overweight. Children with ADHD are more likely to develop substance abuse/dependence (Lee, Humphreys, Flory, Liu, & Glass, 2011). Therefore, it is currently suggested that obesity among individuals with ADHD is the consequence of addiction.

Parents and caregivers' awareness of their child's health status, eating and drinking habits as well as their activity levels, have an important role in shaping their health-related choices. Parents and caregivers of overweight children tend to underestimate the weight status of their children, compared to parents of children with normal weight (Nemecek, Sebelefsky, Woditschka, & Voitl, 2017). Such misperception is likely to lead to decreased motivation to address the need of their child for a change (Lundahl, Kidwell, & Nelson, 2014).

Financial constraints often lead to consumption of low-cost, unhealthy processed food (Neumark-Sztainer, Story, Resnick, & Blum, 1996; Wang, 2001). Moreover, inadequate resources at school or lack of suitable or accessible sports facilities could result in fewer physical education hours each week (McKenzie & Lounsbery, 2009). Youth with ADHD were found to be more likely to have low socioeconomic status (Waring & Lapane, 2008), and therefore are exposed to increased risk for becoming overweight and obese.

Occupational Therapy

By engaging clients in everyday occupations, occupational therapy practitioners promote physical and mental health and facilitate well-being for persons with and without disabilities ("Occupational Therapy in the Promotion of Health and Well-Being," 2013). The American Occupational Therapy Association reported that various occupational therapy interventions could be effective in the area of weight management for children (Reingold & Jordan, 2013). Occupational therapy practitioners should play a pivotal role in formulating physical activity programs that address health management and wellbeing. They can provide meaningful and effective interventions that would motivate individuals in order to modify daily life habits, roles, and patterns. Occupational therapy interventions in the area of obesity may include, but are not limited to the following: community programs of health promotion through lifestyle change; education programs; facilitating the development of new habits and routines; wellness programs for children, teens, and adults; play and physical education in the schools (Salles-Jordan, 2007).

The Keep Moving! Program

Keep Moving! is a 12 weeks program designed to promote physical activity, healthy choices, and prevent overweight problems among adolescents with LD, ADHD. The program incorporates self-management techniques and introduces Zumba fitness, which is a fun and energetic aerobic exercise and dance activity. The program is led by a professional occupational therapist and takes place at school and community centers. There are five key components to the program:

1) Occupation based: Establishing health-promoting habits and routines at home and school.
2) Physical activity: Adding weekly fun and engaging Zumba fitness activities.
3) Health education: Providing information about how to manage a healthy lifestyle.
4) Self-management: Instilling health-related self-regulation skills.
5) Family involvement: Establishing family support for the participants.

The Team

The program was developed and is currently led by Inbal Regev Lavy, an occupational therapist (BA in Occupational Therapy, PP-OTD expected January 2020) and a certified Zumba fitness instructor (Zumba fitness®, Zumba kids®, Zumba kids junior®, Zumba Gold®). Inbal is dedicated to promoting healthy lifestyle among children, adolescents and youth with disabilities.

Evaluation

The evaluation program will be based on two core purposes. The first is to establish a causative relationship between the Keep Moving! program activities and readiness for a behavioral change, improvement in health-related lifestyle, and improvement in health parameters of the participants. For this purpose, pre-post repeat measurement design will be used to assess the progress of each participant. The second core purpose is descriptive and will study the program's characteristics, such as participation, satisfaction and costs effectiveness of the program.

Funding

- Two interventions will be delivered consecutively in the first year. In the second year, two interventions will be delivered concurrently, followed by another round of two more interventions, for a total of four groups in that year.
- The expenses for the program include salaries for an occupational therapist, Zumba Fitness instructor, and a nutritionist consultant. Other expected expenses include fitness watches, consumables and facility rental.
- The cost of implementing the program for a group of 14 participants at a school setting is expected to be $362 per participant.
- The cost of participating in the program will be partially funded by organizations from the government, municipal, public and private sectors (Table 1).

Table 1

Potential sources of funding.

Sector	***Organization***
Federal and municipal	• Israeli National Program for an Active and Healthy Life "Efshary Barie"
Corporate	• Food industry companies • Fitness watch brands
Health Maintenance Organizations	• Four HMOs operating in Israel (Clalit, Maccabi, Leumit, and Meuhedet)
Non-profits	• Nitzan-Israel, the Israeli Association for Children and Adults with Learning Disabilities • The Israeli Association for Public Health

Dissemination

A dissemination plan was created in order to promote the positive outcomes of the Keep Moving! program. The following are the two long-term goals: 1. implementing the program in at least three municipalities within the next two years; and 2. influencing government policy towards adding weekly physical activity and health education curriculum in middle schools and high schools. District supervisors from the Ministry of Education, school principals and community center managers are considered as the primary target audience. Israeli government agencies that may adjust policies to support programs aiming to improve the healthy lifestyle of the targeted population will also be addressed. Community leaders, as well as health professionals, were identified as key stakeholders and will be approached by social media, white papers, brochures, personal meetings, and other measures.

Conclusion

Keep Moving! is an occupational therapy oriented program, uniquely addressing adolescents with LD, ADHD, who are prone to unhealthy behaviors and who are at risk for being overweight. The program is designed to help individuals become proactive participants in their health behavior change. Participants of the program will gain knowledge about healthy behaviors, as well as skills and experience in using self-management techniques for engaging in healthy daily habits and routines. The program introduces Zumba activity as a fun and energetic exercise. Zumba classes are structured as a medium-to-high level of intensity workouts, meeting the American College of Sports Medicine (ACSM) criteria for recommended exercise intensity, and support a healthy

weight (Luettgen, Foster, Doberstein, Mikat, & Porcari, 2012). Family involvement is an essential aspect of the program, and as such, parents are encouraged to take part in the process.

FACT SHEET

BOSTON UNIVERSITY

'Keep Moving!' Occupational Therapy Guided, Health Promoting Zumba Program For Adolescents With LD/ADD/ADHD

Inbal Regev Lavy, B.OT, OTR/L (Israel)
OTD Candidate

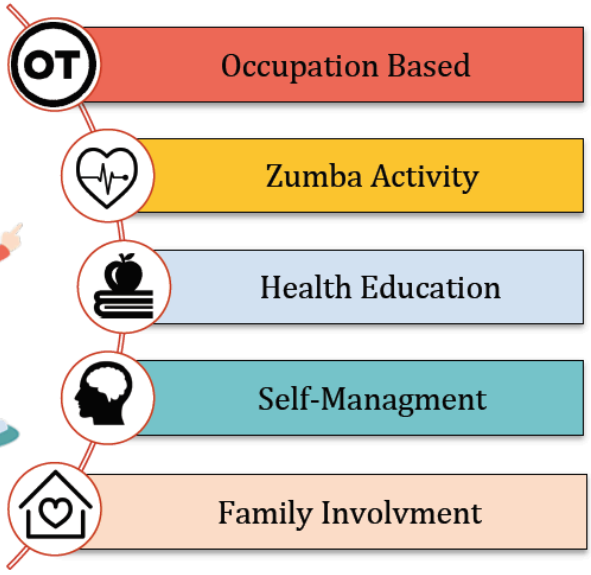
Introduction to the Problem

- Obesity is a global pandemic and a major risk factor contributing to physical and psychological problems. It affects engagement and participation in occupations, and increases healthcare-related costs.
- Over the last three decades, childhood and adolescence obesity, ages 5-19, has increased. Between the years 1975–2016, the prevalence of overweight and obesity has risen from 4% to 18% [1].
- Certain populations are at risk for being overweight and obese. These include low socioeconomic status, racial/ethnic minorities, and individuals with disabilities.
- Individuals diagnosed with Learning Disabilities (LD), and/or Attention Deficit / Hyperactivity Disorder (AD/HD) were also found to face difficulties in maintaining a healthy weight and engaging in healthy behaviors [2].
  Occupational therapy practitioners often address academic and behavioral performance of students with LD or AD/HD. However, special attention should be given to healthy lifestyle components and to weight-management in general [3].

Introduction to the Solution

- An occupational therapy guided, health-promoting Zumba program for adolescents with LD or AD/HD is intended for delivery in schools and community centers.
- The program will assist adolescents in becoming proactive participants in their health-related behavior change.
- The foundations of the program is based on two theories:
  The Trans-Theoretical Model (TTM) of Behavioral change is used to identify the individual's readiness to change [4].
  The Individual and Family Self-Management Theory (IFSMT) to help analyze the components leading to the problem, and to guide the individuals and their families to assume responsibility and actively engage in healthy lifestyle [5].

Keep Moving! Key Components



Introduction to the Program

- Keep Moving! is a 12-week program designed to promote healthy choices and prevent overweight-related health problems among adolescents with LD/ADD/ADHD in Israel.
- The program incorporates self-management techniques and introduces Zumba, which is a form of fun and energetic aerobic exercise and dance activity.
- The program is led by an occupational therapy practitioner, along with a Zumba Fitness instructor and a nutrition consultant.

Impact on Future Occupational Therapy Practice

Keep Moving!

- Cultivates self-management in the target population, thus expressing the client-centered approach, a fundamental concept in occupational therapy.
- Further advances the role of occupational therapy, addressing health promotion and obesity prevention among adolescents at risk.
- Promotes the principle of occupational justice by preventing overweight and obesity, which may limit a person's ability to participate in meaningful occupations.

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