

# Weight Loss Intervention in Young Adults with Severe Learning Disabilities: The Additive Effect of Cognitive Behavioral Treatment (a Pilot Study)

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**Abstract:** The prevalence of obesity is reported to be higher among people with intellectual disabilities compared to the general population. Factors which were suggested to contribute to this increased prevalence include: low adherence to healthy diets, poor level of physical activity, intellectual disabilities and the lack of residential settings supporting independence. This study was designed to evaluate the additive effect of an intervention in the form of cognitive behavioral treatment (CBT) in a multi-strategy weight loss program for young adults with severe learning disabilities living in group residences in the community. The study population included 28 subjects (12 males) who were randomly assigned to one of two groups. Both groups had a weekly meeting with a dietician and were invited to take part in walking groups. One group (intervention group) had on top a weekly session of CBT. The results of our study indicate that adding a CBT component to a conventional program aiming at improved nutritional understanding (prudent diet, physical activity) of subjects with LD may improve the success for change in life habits, yet, in our study this effect was noticeable only on follow up few months after study termination. Neither group differences at baseline nor differences in the scoring for the locus of control questionnaire at baseline could predict this outcome. This delayed impact warrants further investigation.

**Keywords:** Weight Loss, Learning Disabilities, Cognitive Behavioral Treatment Bazanno.

## INTRODUCTION

The obesity epidemic became the number one epidemiological health problem at the end of the 20<sup>th</sup> century, but the rate of success of various interventions to both prevent and treat obesity remains unsatisfactory [1]. Obesity and overweight are independent risk factors for chronic diseases and reduced life expectancy [2]. It is assumed that the prevalence of obesity is higher among people with intellectual disabilities compared to the general population [3, 4], and obesity was suggested to play a major role in the reduced life expectancy of this population [5]. Factors which were suggested to contribute to this increased prevalence include: low adherence to healthy diets, poor level of physical activity [6], intellectual disabilities [7] and the lack of residential settings supporting independence [8].

Relatively few studies have examined the effectiveness of weight loss interventions in adults with learning disabilities, thus there is little evidence to support interventions in this population [9]. Studies on adults with intellectual disabilities have shown that behavioral treatment focusing on self-control techniques was effective in promoting weight loss [10],

and that cognitive behavioral therapy (CBT) had an impact in changing diet habits and lifestyles in intellectually normal subjects with eating disorders [11]. Rational Emotive Behavioral Therapy (REBT), developed by Ellis in the 1950's, is one of the central theories in the field of cognitive-behavioral intervention whose implementation in individual, couples and group therapy has been shown to be highly effective [2]. Significant positive changes were found in various studies on the effectiveness of REBT group interventions for dealing with eating habits, food consumption, body image, self-efficacy, weight loss and other issues [13]. However, the effectiveness of interventions to maintain long-term weight loss has not been studied. Multi-component interventions that focus on multiple weight loss strategies (diet, behavioral treatment, physical activity and care involvement) would appear to be an optimal approach for achieving these goals. This study was designed to evaluate the additive effect of psychological intervention in the form of cognitive behavioral treatment in a multi-strategy weight loss program for young adults with severe learning disabilities.

## METHODS

### Participants

The study population included 28 subjects (12 males) who were randomly assigned to one of two

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groups, each consisting of young adults who graduated from the Onim Program For Adults With Learning Disabilities. All of them lived in Onim's protected environment for 2 years in order to learn social skills, after which they moved to group residences in the community. The experiment group included 16 adults with learning, adapting and functioning disabilities and twelve participants from the same program who had a similar intervention without the CBT intervention. Both groups were composed of subjects with varying capabilities.

### **Setting**

"Nitzan Onim" is a holistic transition program for young adults with severe learning disability (LD) and co-morbidity [14]. It is generally recognized that many high school graduates with severe LD are generally unprepared to meet the demands of adult life and therefore unable to exploit their full potential. The program final goal is to achieve independent life style in the community. The program involves group activities such as: sex education, vocational expertise as well as personal counseling. The program extends over two years, at the end of which the trainees move on to independent living accommodations within the community. The project was set up within the framework of a residential post-high school campus. The trainees live in small cottages which are situated within a private residential neighborhood in the center of the city.

### **Intervention**

The study intervention lasted 3 months and was followed by 3 months maintenance. Meetings took place in the evening once weekly. The topics which were discussed included: macronutrients, food serving and portions, physical activity, prudent diet, how to read food labeling and diet related disease (diabetes, hypercholesterolemia and hypertension). The activities took place in both large and small groups and did not require reading and writing skills. At the end of each meeting, the participants were assigned a task for the coming week and this topic of discussion during the next meeting.

### **CBT Meetings**

Group therapy sessions were held once weekly, immediately after a one-hour group session with the dietitian during the first stage of the study (3 months). Each session lasted for one hour and was conducted according to REBT principles. The main goal was to

support the weight loss process by a cognitive-behavioral therapeutic intervention. The opening session lasted for 1.5 hours and included an introduction and a description of the process and its goals as well as a discussion of the group rules. After the opening session, the group met for another 12 hourly sessions. At the end of the intervention, there was an additional closing session in which the meetings' contents and processes were summarized.

The participants were taught the REBT principles during the first four sessions. They acquired basic theoretic concepts such as "Activating Event", "Beliefs" and "Consequences". They also learned about the differences between "Thinking", "Feeling" and "Behaving". The group discussed features of each component of the REBT structure in each session. In addition, the participants were introduced to the elements that allow the interaction and integration between components. Each session was dedicated to one theoretical component and started with two experiential activities to illustrate the session's topic. After the experiential illustration, the group analyzed the experience and translated it into a theoretical level. The participants were asked to keep a weekly diary for the component they had learned about during a specific week (e.g., recording of activating events, thoughts, etc.). The emphasis during the four subsequent sessions was mainly on the implementation of the acquired material. Following the REBT structure, the participants analyzed different situations as they applied to the weight loss process. They discussed how to cope with changes in their daily habits. They gave personal examples of activating events, thoughts, feelings, behaviors and physical changes that took place between group sessions. The homework given at this stage was to document situations using the REBT structural outline and the participants were asked to share these tables with the group for analysis.

During the last four meetings, on top of the continued work on the schema and its' implementation in everyday life, the conversation was broaden to include other topics that rose due to the weight loss process. Topics that were discussed included positive thinking, self-image, self-efficacy, the differences between emotional vs. physical eating, feelings and thoughts regarding failure and success and more.

### **Resting Energy Expenditure (REE) and Body Composition**

REE was measured by an open-circuit indirect calorimeter (Deltatrac, Helsinki, Finland). The subjects

fasted (unlimited water consumption was allowed) from 20.00 the night before the test until the next morning. They were placed in a supine position for 20 min prior to commencement of the study at 08.00. After calibration with standardized oxygen and carbon dioxide gas concentrations (95% O<sub>2</sub> 5% CO<sub>2</sub>), a plastic canopy was placed over the patient’s head and REE was measured for one hour. There was a 10-min washout period before starting data collection. The inter-individual coefficient of variation in our laboratory is <3%. The respiratory quotient (RQ) was determined based on the above measurements (an RQ value of 1 indicated exclusive carbohydrate utilization while an RQ of 0.7 indicated exclusive lipid utilization). The average RQ of healthy controls in our laboratory is 0.83 ± 0.04. Fat and lean body mass were determined by dual energy X-ray absorptiometry (DEXA) [15]. All participants were weighed and their body mass index (BMI) was calculated before the intervention was activated and after it was terminated (Table 1).

**Locus of Control**

“Locus of control: is a psychological construct that refers to whether or not individuals believe that they are in control of their actions. The subjects were asked to fill in a multidimensional locus of control questionnaire before starting the program in order to determine whether this parameter was likely to affect the results [16].

**Statistical Methods**

The unpaired t-test was used to compare all the parameters between the two groups. Significance was set at *p* < .05.

**RESULTS**

No group differences in any of the body composition parameters, REE and the scoring for locus of control were found at baseline. Most of participants attended most of the meetings and the level of compliance was high according to the weekly reports. The rate of success of the program and the implementation of its concepts, however, was poor. There was a clear lack of motivation for physical activity in spite of the fact that this topic was discussed repeatedly during the meetings. A twice-weekly walking group was organized but only few study participants and controls joined it. Those who did exercise (walking, swimming, etc.) seemed to lose more weight. Most of the participants shared the same residence; this enabled us to involve other staff members in the process. The dietician met with the staff once before initiating the study and twice during the intervention. The staff accompanied the participants during shopping and cooking and could assist in choosing a healthier diet. Those who lived in residencies in which there were no other participants complained about difficulties in complying with the rules of the program.

A tendency for weight loss was found in both groups (Table 1), yet most of the subjects did not lose any weight and some of them even gained weight (Table 2). No differences were found in any of the body composition and REE parameters (Table 1). Interestingly, during the 7 month follow-up (3.5 months after the study was closed), 6 of the 13 subjects in the CBT group and 3 of the 14 controls lost more than 3 kilograms compared to their baseline measurement, but only one member of the CBT group maintained this

**Table 1: Changes in Anthropometric Parameters Over the 3.5-Month Study Period**

	No CBT	CBT	<i>p</i> = (t-test)
Baseline weight (kg)	81.06±15.51	85.00±19.96	.54
Weight at close of study (kg)	78.65±16.14	82.5±18.97	.55
Baseline BMI (kg/m <sup>2</sup> )	31.46±5.86	31.93±5.18	.82
BMI (kg/m <sup>2</sup> ) at close of study (kg/m <sup>2</sup> )	30.58±6.42	31.05±5.24 32	.83
Body fat % on admission	41.53±8.73	47.03±5.70	.05
Body fat % at the end	41.78±8.15	46.23±5.36	.09
Lean body mass on admission (kgs)	45.04±10.93	43.19±11.80	.65
Lean body mass at the close of the study (kgs)	43.92±10.45	42.54±11.07	.72
Baseline REE (kcal/d)	1700±379	1730±311	.81
REE at the end of study (kcal/d)	1605±381	1649±305	.73
Baseline RQ	0.80±0.07	0.85±0.07	.24
RQ at close of study	0.84±0.07	0.86±0.10	Student T test.38

Note: CBT = cognitive behavioral treatment; BMI = body mass index; REE = resting energy expenditure; RQ = respiratory quotient.

**Table 2A: Individual Changes in Weight During the Study Period and Follow-Up In Group 1 (CBT Intervention)**

Baseline	2 months	3.5 months	7 months	12 months
88	87	87	82	
78	77.5	78	74	75
64	64	65	65	66
64	66	65	65	70
70	71	70	64	71
104	105	104	100	104
103	103	103	100	
93	94	95	95	95
53	55	55	53	54
104		104		
82	83	83	81	85.5
105	106	108	106	102
117	115	115	114	

**Table 2B: Individual Changes in Weight During the Study Period and Follow-Up in Group 2 (w/o CBT Intervention)**

Baseline	2 months	3.5 months	7 months	12 months
107	110	106	110	103
66		68	65	
82	81	84	80	
76	77	77	78	
73	70	73	71	
85	86	87	82	
96	96	99	97	
68	68	70	67	66
64	63	64		66
82	81.5	81	76	80
83	86	86	86	
70	69	69	66	
97	86.5	86	90	
72	69	69		

lower weight at 12 months (Table **2A & B**). The CBT intervention did not seem to add any extra value to weight loss, in spite of the fact that 9 out of 13 CBT subjects attended the meetings compared to only 4 of the 14 controls. In the conversation during the last meeting, 4 of the study subjects indicated that the CBT intervention increased their understanding about the forces behind their eating behavior, their food choices and their motivation (or lack of) to lose weight. There was no indication that the anthropometric

measurements helped the participants to better understand the process of weight loss or increased their compliance.

## DISCUSSION

The results of our study indicate that adding a CBT component to a conventional program aiming at improved nutritional understanding (prudent diet, physical activity) of subjects with LD did not improve

the success rate of weight loss or physical activity. Nevertheless, more subjects in the CBT group lost weight compared to the control group at the 7-month follow-up evaluation. This delayed impact warrants further investigation. Neither group differences at baseline nor differences in the scoring for the locus of control questionnaire at baseline could predict this outcome. Our results are similar to those of other studies on achievements of weight loss in overweight subjects [17]. In comparison to our previous experience, however, the rate of weight loss during this study was slower and the results were seen later (at 7 months) (Vaisman, Tel Aviv Sourasky Medical Center, personal communication). Our results may be characteristic of our study population on the one hand or reflect the fact that our subjects did not voluntarily choose to start dieting but rather agreed to participate in a program that had been suggested to them by the staff of their residence in the community housing environment.

Four of our 16 study subjects were overweight and 4 were obese. Similar ratios of overweight versus obese were found in other studies on subjects with intellectual disabilities [18]. In addition, Rimmer and Yamaki reviewed the limited literature on the prevalence of obesity in adults with mild to moderate intellectual disabilities, in and outside the USA: overall, they found similar rates of obesity compared to the general population [19].

The current concept to move adults with LD from long-stay in learning disability institutes to community homes poses some problems and facilitates others. All of our subjects now reside in the community and their living conditions afford them much more privacy than they had in an institution, including the possibility of influencing their own food choices. It is not surprising, therefore, that moving from highly monitored residencies was shown to usually result in a significant change in body weight. In Sweden, 44% of 55 subjects had increased body weight and 13% had decreased body weight 5 years after moving from an institution [19]. Similar results have been found in other studies [18]. Many of our subjects admitted having gained weight since moved to the community housing. Our results also indicate that a community-based program which involves all the residents as well as the staff improves compliance. The fact that this group is prone to develop food-related diseases led the WHO to point out a need to improve food supply and nutritional status of this population [21].

The issue of dietary composition was not studied in our subjects prior to commencing the study due to poor compliance. The earlier-cited Swedish study found that a high proportion of the energy in the daily diet was consumed in-between meals and that this group typically had a low intake of fibers, especially fruits [19]. Total energy intake and other food items as well varied considerably between individuals, and the researchers concluded that every adult with intellectual disabilities should be treated as an individual with specific needs. We did not provide individualized diet sessions, and the group meetings were geared more towards increasing general knowledge and suggesting better healthy choices based on this knowledge.

The current understanding is that enduring weight loss can only be achieved as a part of a change in lifestyle. Only few studies addressed this concept in adults with intellectual disabilities. In a recent report on a lifestyle change program in subjects with developmental disabilities, the investigators concluded that a community-based program is feasible for these subjects [22]. Twenty percent of their 85 eligible subjects signed up for the program and 44 percent of them completed it. The average BMI decrease was  $0.5\text{kg/m}^2$ , the abdominal girth decreased in 74% of the participants, and 61% of them reported increased physical activity both in mean exercise duration as well as in exercise frequency. A significant improvement was also reported in nutritional habits, self-efficacy and life satisfaction [22]. 4 of our subjects reported changes in their exercising habits and 10 noted changes in their nutritional habits. Our follow-up evaluations revealed no changes in body composition or REE measurements. A recent report by another group of Swedish researchers described an upcoming intervention in adults with intellectual disabilities residing in the community [23]. Their intervention is in principle similar to ours and is based on social cognitive theory. The program will include three components: 1) ten health education sessions for residents in their homes, 2) appointment of a "health ambassador" among the staff of each residence, and 3) formation of a study group comprised of the staff in each residence. This approach is different from ours by focusing mainly on the staff members.

In conclusion, this preliminary study looked at the possibility of adding a cognitive behavioral approach to a lifestyle change program in subjects with LD living in the community. Although the results were somewhat disappointing, our subjects were highly motivated during the period of intervention and a few of them

seemed to acquire long-standing changes, mainly those who participated in the CBT arm. Strangely, weight loss and lifestyle modifications seem to happen after completing the intervention. This may be one of the characteristics of this specific population and warrants further investigation. Based on the above considerations, we suggest investing more efforts in future studies on subjects with intellectual disabilities, applying a variety of approaches. A residency-based program, deep involvement of the staff, and special focus on physical activity may be of great benefit.

## DECLARATION OF CONFLICTING INTERESTS

The authors declare no conflicts of interest with respect to the authorship and/or publication of this article.

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