

Bio-Psycho-Social Approach to the Treatment of Childhood Obesity: A Novel Technique

Charles Nguyen¹, Kevin Bera²

¹UC Irvine Medical Center, California, USA

²University of Southern California, USA

Corresponding author: Kevin Bera, University of Southern California, USA, **Tel:** 949-933-0380; **E-mail:** Kevinbera24@gmail.com

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Background

The increasing prevalence of childhood obesity, which has tripled since 1980 to nearly 17%, has become a major public health concern, resulting in the need for more effective approaches toward weight loss. The estimated annual medical cost of obesity in the U.S. was \$147 billion in 2008; the medical costs for people who are obese were \$1,429 higher than normal weight people [1].

Current weight loss approaches include nutritional education and exercise, behavioral strategies aimed at lifestyle modifications, or nutritionally restrictive dieting. Numerous randomized trials comparing different diets (e.g., low carbohydrates, low fat) have shown minimal differences in weight loss (mean difference of < 1kg) and metabolic risk factors [1]. Adherence was most strongly associated with weight loss in 4 meta-analyses of diet comparison studies summarizing 13 to 24 clinical trials [2-5].

We will show how a “Bio-psycho-social” approach that addresses the biological, psychological, and behavioral issues, is more effective to help children lose weight. Patients are taught that high insulin levels prevents your body from using fats for fuel, leaving you unable to burn fat. You’re adding more fat, but you can’t burn it off. To demonstrate the efficacy of this approach, a retrospective review of adult patients completing a weight loss program was performed. We will review these findings and describe two cases in how this approach was successful in the treatment of children with obesity.

Methods

A “Biopsychosocial” approach was used to help patients lose weight at an outpatient weight loss clinic. The program teaches the role of insulin in weight loss, uses appetite suppressants to reduce cravings, implements cognitive behavioral therapy to reframe thinking, and utilizes behavioral therapy to break old eating habits through six visits. From 2011-2013, 142 adult patients who completed at least 8 weeks of treatment were retrospectively reviewed and analyzed. Data included demographics, duration of treatment, medications, weight, and BMI.

The patients presented for an initial appointment, a 1-week follow-up, and monthly visits thereafter. The initial visit lasted 45 minutes, and each subsequent visit was 10-15 minutes.

At the initial visit, patients were taught about the biopsychosocial method to weight loss (see below) and prescribed a weight loss drug by the same board-certified psychiatrist throughout the visits. In detail, patients were taught about the five food groups (fruits, vegetables, proteins, sweets, and grains) and how insulin affects these groups. They were then taught about which food groups increase insulin level and thus resulted in more fat storage. They were then given a weekly meal plan to follow. At subsequent visits, patients had brief CBT sessions to address cognition distortions, behavioral therapy to break bad habits, nutritional education to lower carbohydrate and sugar intake, and med management of any potential side effects.

The Biopsychosocial program combines the medical knowledge of insulin with cognitive behavioral therapy to reframe thinking and behavioral therapy to break unhealthy habits while forming effective ones to replace them.

Following the success seen in adults, we are now beginning to use the Biopsychosocial Approach in children and adolescents. The only difference is that the children are not placed on any medications. Two case studies shown below will illustrate the success of this approach to obesity in adolescents.

Biological

Teaches the role of insulin in weight loss

Patients were taught about insulin, its role in fat storage, and the importance of avoiding foods that could spike their insulin during the weight loss phase. Patients were taught 4 simple food groups that affect insulin: sweets (desserts, sugary drinks, candy), grains (bread, oatmeal, cereal, rice, pasta), starchy vegetables (potatoes, corns, carrots, and beets) and high Glycemic Index (GI) fruits. These foods are to be avoided during the weight loss phase to keep insulin low.

Phentermine was used to assist patients with their new eating behavior for most of the patients. Through its mechanisms as a

sympathomimetic amine, it increases norepinephrine and epinephrine release to help suppress appetite while maintaining energy and alertness.

Psychological

Challenge cognitive distortions and reframe their thinking

CBT techniques were incorporated into this program to help participants reframe their thinking toward weight loss and dieting. The following phrases were cornerstones to this approach.

For example, the concept of “Thinsulin”- Think thin, think insulin was introduced. Patients reframed their thinking from “weight loss is about eating less” to “weight loss is about lowering insulin.” Patients are taught to categorize what they eat into 4 food groups (sweets, grains, vegetables, and fruits). Among the four groups, the patients are taught what kind of foods would spike their insulin level. They were encouraged to eat more protein such as lentils, egg whites, and meat as these foods don’t spike insulin level.

“I am not on a diet.” The term diet is often associated with deprivation and hunger. Dieting also typically triggers a ‘feast-famine’ mentality and behavior that leads to inadequate results and discouragement. By changing thought patterns related to diet and nutrition where “on a diet” is replaced with “insulin level mindfulness”, a paradigm shift occurs.

“I eat for enjoyment.” Patients are taught to reframe “I enjoy eating” to “I eat for enjoyment.” It’s important to acknowledge the importance of enjoyment of life and certainly foods but not whenever you want. By switching the order of two words around, the patients understand that they can have their “enjoyment” (or anything that increases their insulin) only after they eat their breakfast, lunch and dinner.

Behavioral

To break old eating habits and develop new ones

Patients were instructed to avoid sweets and artificial sweeteners because artificial sweeteners encourage sugar cravings and sugar dependence. To extinguish sugar cravings, patients were asked to avoid all sweets such as desserts, candy, soda, and refrain from adding or consuming any products that contain artificial sweeteners.

Patients were instructed to eat five meals a day to avoid feelings of deprivation and told to never starve themselves. An outline of a day’s meal is as follows:

Breakfast- 1 portion of protein or dairy product

Morning Snack- 1 portion of low GI fruit (apple, citrus, grapes, berries)

Lunch- 1 portion of protein and vegetables

Afternoon Snack- 1 portion of nuts

Dinner- 1 portion of protein and vegetables

The “Biopsychosocial” approach is a systematic way to change a patient’s thinking (psychosocial) in order to apply instruction provided to the patient (e.g., nutrition and insulin education, glucose level maintenance) without resorting to chicanery or deprivation, by changing their eating habits (behavior).

Case Studies within Children

Case study 1

9 year old girl who initially weighed 135 pounds (BMI=33.8). When she was initially seen with her mother, she shared that her friends were making fun of her at school. Her mother didn’t want this to be a diet program: “I don’t want her to grow up with an eating disorder problem.” Throughout the sessions, an emphasis was placed on teaching about the effects of sugar on insulin, and what insulin does to fat storage. Colorful illustrations were shared with the patient to help her choose foods that don’t spike her insulin level. The major focus was targeting sweet drinks and snacks. The patient was encouraged to choose water and milk. No medications were prescribed. In addition, she was taught to eat fruits and nuts as her snack choices rather than chips, cakes, cookies and ice cream. After 3 months, she lost 8% of her weight (124 pounds, BMI=31). Both patient and parent were satisfied with the outcome and were determined to continue this program on their own.

Case study 2

17 year African American male who initially weighed 210 pounds (BMI 30.1). Drank diet shakes with no success. Came in with his mother and educated about the role of insulin in storing fat. Attended regular sessions for psychological issues. He understood foods to avoid that spike insulin and instead to choose protein and green, leafy vegetables. By week 4 he lost 9 pounds (4.2% of initial weight). Then he added exercise and continued to think of food in terms of insulin impact. By week 8, lost 11 more pounds, now weighing 190 pounds (BMI=27.3). Now focused on cognitive therapy to help him change his thinking. No medications were provided throughout his care. By week 12, weight was 180 pounds (BMI=25.82). One year later came back for follow-up visit, where weight remained steady and 181 pounds (25.2).

Results

As stated in the methods section, only adult patients ages 18-75 were seen. Participants lost an average of 22.8 pounds, or 10.8% from the initial weight ($p<0.001$) over an average of 86 days of treatment. However, judging from the results, this program now incorporates children and adolescents for this approach.

Discussion

Biopsychosocial approach did allow the clinicians to shift the focus from biomedical model to a more comprehensive

approach. Biomedical model focusses on pathophysiology and other biological approaches to a condition such as any underlying deviation from the normal function thus fostering potential dualism. Biopsychosocial approach looks at the person as a whole, from the subatomic level to society and environment the person lives. The interplay between biological, psychological and social factors will change over time and is important to continuously evaluate and incorporate in the treatment plan. The previous studies looking at interventions on one or two approaches provide an initial response but in time fail probably because of the constant dynamic and interplay between those domains.

Cognitive behavioral therapy (CBT) is a structured, short-term, present-oriented psychotherapy directed toward solving current problems, and modifying dysfunctional thinking and behaviour [6]. CBT has been found useful in weight loss programs, with studies [7] showing increased weight loss when CBT is combined with diet and exercise interventions when compared with diet and exercise alone.

In this study the patients were instructed to avoid sweets and artificial sweeteners. Experiments generally have found that sweet taste, whether delivered by sugar or artificial sweeteners, enhanced human appetite [8-11].

The majority of weight loss programs focus solely on one or two aspects, such as diet, weight loss medication, cognitive-behavioral therapy, or behavioral modification programs. To our knowledge, this is the first program that integrates biological, psychological, and behavioral interventions in an outpatient setting. The resulting 10.8% reduction in weight and BMI over 86 days of treatment shows the potential efficacy of an outpatient-based program for weight loss using a "Biopsychosocial" intervention. The study reports that a combination of pharmacotherapy, nutritional education, cognitive behavioral therapy, and behavioral modification in short 10-15 minute monthly visits may lead to weight loss. This same technique can also be used in children and adolescents with success. It is important to note that for children to be successful in this program, they must not only come to each session with their parents, but that their parents need to be following this approach as well.

The limitations of this study include that it was a small, retrospective study with no control group, which makes it difficult to determine exactly which aspects of the treatment were most effective for patients. They may have benefitted from the contact with the clinic staff and the accountability therein as much as from the integrated shifts in their thinking and behavior around food. There were large variations in the length of patient participation and so the results may be varied across patients. Patients were required to self-fund their participation in the program, which limits the socioeconomic spectrum of patients that were able to participate, may have increased the likelihood for weight loss due to financial incentives, and may have self-

selected for a more highly motivated group of participants. Additionally, the study only examined patients that completed at least 8 weeks of the program and was not able to assess whether the weight loss was sustained over time after patients left the outpatient clinic's services. Lastly, we continue to work with children and continue to gather more data.

Conclusion

These preliminary results are promising working with children, but there's a lot of limitations to a retrospective review. Further research into the efficacy of the "Biopsychosocial" approach to weight loss is needed. A randomized, controlled study with a larger pool of patients would be useful in determining the long-term benefits and the widespread applicability of the "Biopsychosocial" approach.

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