CHAPTER 3

PREDICTORS OF CHILDHOOD OBESITY

Concern over childhood obesity was expressed as early as 1968. At the time, Dr. Jean Mayer, the world-renowned nutritionist and advisor to presidents Nixon, Ford and Carter, referenced data that led him to believe that American youth were becoming disturbingly overweight and sedentary. Mayer could not have made a finer prediction given that the number of overweight and obese youth was considerably smaller in comparison to today's statistics. Mayer died in 1993 and consequently did not witness how childhood obesity has become an epidemic. While Mayer and other medical pundits could have very well known the course of children's girths, many persons, especially those without medical or public health training, did not. In fact, many are still asking, "How does a child end up in the predicament of being overweight or obese?"

As aforementioned, weight gain occurs when there is an energy imbalance between energy input or intake (the calories from the food we eat) and energy output (the calories we expend from physical exercise and body metabolism). When the imbalance is such that energy input is consistently higher than energy output, the weight increases. The core of weight gain then is this imbalance, and more importantly the factors that lead to this imbalance. There are many factors that contribute to the imbalance. Some of these causative factors are behavioral, or modifiable. In other words, they can be manipulated. Other factors cannot; they are considered non-behavioral, such as genetics or medical problems. Because childhood obesity is a complex condition, it is likely that no one single factor causes a child or adolescent to become overweight or obese. In fact, health experts believe that the imbalance is attributed to the interaction of multiple factors, generally the child's genetic make-up and his environment, that results in excess weight.

This chapter explores the causative factors that play a role in children's weight gain. In particular, this chapter seeks to answer the following questions:

- What are the non-behavioral causative factors associated with childhood obesity?
- What are the behavioral causative factors associated with childhood obesity?
- Based on these causative factors how is childhood obesity treated?

CHAPTER 3

WHAT ARE THE NON-BEHAVIORAL CAUSITIVE FACTORS ASSOCIATED WITH CHILHOOD OBESITY?

Childhood obesity has no one identifiable, contributing factor as its source. Children gain weight in our society for multiple and varied genetic, environmental, and behavioral reasons, which are often referred to causative factors. The degree to which each of these factors contributes to childhood obesity remains uncertain and unclear, but apt to differ from child to child (Lynn-Garbe & Hoot, 2005). More importantly, children are likely to gain weight because of the entangled interaction of genetics and the socio-cultural environment where they live (Smith, 1999). Weight gain is certainly attributed to behavioral causative factors, or factors that can be adapted (such as children's eating and physical activity habits). But, the non-behavioral causative factors, those that cannot be changed, also play an important role in determining the source of children's weight. Some of those noteworthy non-behavioral causative factors include: genetics, conditions of the endocrine system, and race/ethnicity.

Genetics

That genetic syndromes cause obesity is a rarity. Many scientists believe that single gene defects account for a meager percentage of obesity (Strock, Cottrell, Abang, Buschbacher, & Hannon, 2005). Nonetheless, genetic disorders can directly cause obesity. A list of some of them can be found in Table 8, but the genetic conditions most closely linked with childhood obesity include Prader-Willi syndrome, Bardet-Biedl syndrome, and Cohen syndrome. (Consult the brief tutorial on chromosomes and genes in Figure 4 to better understand these syndromes).

Table 8. Genetic syndromes associated with childhood obesity[i]

Genetic syndromes	*Associated characteristics*
Alström	Obesity, retinitis pigmentos (a condition that can lead to blindness) deafness, diabetes mellitus
Börjeson-Forssman-Lehmann	Obesity, mental retardation, small testes, low metabolism, epilepsy
Turner's	Short stature, undifferentiated gonads, cardiac abnormalities, webbed neck, obesity
Familial lipodystrophy	Thickening of the muscles, abnormal size as a result of having abnormal pituitary secretions, liver enlargement, acanthosis nigricans (darkening of the backside of the neck), insulin resistance, high triglycerides, mental retardation
Beckwith-Wiedemann	Gigantism, protrusion the navel, enlarged tongue, visceromegaly
Sotos'	Enlarged brain, physical overgrowth, low muscle tone, delayed motor and cognitive development
Weaver	Infant overgrowth syndrome, accelerated skeletal maturation
Ruvalcaba	Mental retardation, small jaw, skeletal abnormalities, small testes, shortness of toes or fingers