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Baby's Best Start: WIC's Role in the Alleviation of Childhood Obesity

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Baby's Best Start: WIC's Role in the Alleviation of Childhood Obesity

Introduction

When the typical American thinks of the ways in which food intake can affect a child, their mind usually jumps to malnourishment and issues that arise when babies are underfed. They often have the awful pictures come to mind that we have all seen of malnourished children in developing countries. What they do not initially think about, however, is the exact opposite of the malnourished child. Many do not realize that potentially just as dangerous as underfeeding is overfeeding, or the feeding of highly processed foods. Many parents would be appalled to see a malnourished child, but smile and pinch an overweight baby. This rhetoric perpetuates obesity from a young age, and positively reinforces new mothers to feed their children foods that may put them at risk for many dangerous health complications throughout their life.

Though obesity and childhood obesity have long existed, in the past 50 years, the United States has gone through an epidemiological transition. As the most common cause of disease has shifted from infectious agents to chronic conditions, obesity is and remains a very prevalent issue across the country. This shift reflects an improvement in the country's overall ability to treat infectious disease, but a lack of the (general) American ability to maintain a healthy diet and lifestyle. Nationally, about 25% of America's children are overweight, 11% of them being obese. This represents epidemic-level prevalence (Dehghan et al. 2005). 60% of these children grow up to be obese adults and are at risk of overweight-related illness (Dehghan et al. 2005). Obesity sets the stage for later ailments such as hypertension, dislipidemia, hyperinsulinemia, heart disease, and type 2 diabetes (Faith et al. 1997). In order to protect yourself and your family as well as prevent obesity and its assortment of issues, a healthy lifestyle should be maintained.

This prevention can and should start as early as childhood—the earlier the normalization of healthy habits, the better.

This integration of healthy foods into the household, however, is easier said than done. Many families, especially those with lower-income rates or comprised of solely single mothers and their children, find it increasingly difficult to put truly healthy food on the table. This is because healthy food is often much more expensive than mass-produced, sugary, fatty, calorie-packed junk foods that are easy to make and that kids (usually) love. According to the *American Journal of Public Health*, the prevalence of early childhood overweight cases is 12%, 9.7%, 7.8%, and 7.1% for Latino, Asian, African American, and Caucasian families, respectively (Crawford et al. 2004). 60% of these children are predicted to have 1 or more biochemical or clinical cardiovascular risk associated with this extra weight (Crawford et al. 2004). This needs to change (and can!) with the proper prevention mechanisms put in place such as WIC (Supplemental Nutrition Program for Women, Infants, and Children).

WIC works within each state to ensure that families earning below a varying weekly, monthly, or annual income are with supplemental means of providing nutritious foods. WIC families receive vouchers that they may use to purchase healthy foods such as milk, cheese, cereal, and fruits and vegetables. Under WIC, new moms additionally receive formula for their infants, nutrition education, and breastfeeding guidance. Programs like these enable the decrease of childhood obesity and allow the implementation of positive contributions to a child's lifelong health. This research seeks to not only define childhood obesity and explore its associated complications, but to also determine why it is so prevalent in our society and how interventional programs such as WIC can help ease its effects.

Definitions, Prevalence, and Contributing Factors of Childhood Obesity

Although most people are familiar of what it is to be obese, determining obesity isn't always black and white. Often, it is difficult to decide if a child is overweight versus if a child is obese without looking at their Body Mass Index (BMI). According to a comprehensive review of known obesity facts and statistics published in a 1997 book titled *Preventative Nutrition: The Comprehensive Guide for Health Professionals*, obese is defined as containing a "BMI greater than or equal to the 95th percentile" (Faith et al. 1997). Also included in the characteristics of obesity is an increased waist circumference size. Over the past 30 years, average waist circumference size has risen about 7 cm for males and 6 cm for females, respectively (Faith et al. 1997). Among the younger population, researches found that the increase of subcutaneous body fat is the greatest in males between 6 and 11 years (Faith et al. 1997).

According to *Preventative Nutrition*, about 15.5% of 12 to 19 year olds, 15.3% of 6 to 11 year olds, and 10.4% of 2 to 5 year olds are currently obese. This is more than a 10% increase between the years of 1988 and 1997 (Faith et al. 1997). Interestingly enough, it was determined in a 2013 CDC Morbidity and Mortality Weekly Report that childhood obesity is seen at its highest rates among children that live in neighborhoods with unfavorable social conditions (Sekhobo et al. 2013). This may be due to the fact that families that live in unfavorable social environments typically may not have the means to provide multiple healthy meals a day to their children. A study by PB Crawford and his colleagues in the *American Journal of Public Health* supports this claim, determining that the risk of pediatric obesity is highest among low-income families (Crawford et al. 2004).

While there are many contributing factors as to why obesity is so prevalent in the US, specifically among low-income families, much of the country's struggle comes down to *ease*. Prepackaged, warmed up meals are undeniably quicker, easier, and more simple a dinner to

provide. They are often packaged in a way that determines it as “family style” and romanticizes its concept in order to get consumers to buy. Though easy, these meals typically have many hidden fats and high sodium contents. For example, just one serving of a family size package of On-Cor chicken parmesan patties, something I myself grew up eating, contains 18% of a day’s suggested fat intake and 25% of the suggested sodium intake. These numbers do not seem overwhelmingly bad, but it also needs to be taken into account that the serving size of one patty is not typically enough to fill someone up for the evening, and is often paired with sides. Depending on these sides (let’s say a side of broccoli versus a side of macaroni and cheese) this dinner can provide you with nearly half of the suggested fat and sodium intake for a day, but it nearly never actually half of what someone eats throughout the day, as there are three meals and often snacks in between. This meal, like many other meals offered in the freezer section at grocery stores, perpetuates the weight gain that the US struggles to avoid.

Another key factor that contributes to the influx of nutrition-poor food purchases is that often, healthy foods are significantly more expensive than their fatty, unhealthy counterparts. Because the price point of many healthy foods is exponentially higher than junk foods—for example, a 1-2 serving, 1.1 lb container of cantaloupe is currently \$5.49 at Hyvee while a 6-pack of single-serving bags of Cheetos is \$2.69 for the bunch—families that shop healthier undeniably spend much more money. Furthermore, an 8 oz bag of White Cheddar Baked Cheetos (the cheetos’ slightly healthier counterpart) is more expensive than the bunch of 6 bags of regular cheetos at \$3.99. This price increase not only makes it hard for lower income households to buy healthy foods, but also makes it more difficult for already overweight or obese low-income families to make a change. If children see their parents eating unhealthy foods, they are likely to

maintain a similar diet, and the elevated risk and/or disease(s) associated with pediatric obesity are sustained generation to generation.

Health Complications and Risks associated with Childhood Obesity

Pediatric obesity perpetuates many health risks and complications. This is because excess fat can make the heart work harder and put various organs under otherwise unnecessary stress. One of the primary health complications due to obesity is hypertension. Those with body fat in excess of 25 to 30% (so, those that are obese) are at a significantly higher risk to developing hypertension, the raise and retention of blood pressure. Hypertension develops when the pressure put on the walls of your blood vessels is significantly higher than the normal pressure of 120/80 mmHg. This is an imbalance between “energy intake and energy expenditure” (Jiang et al. 2016). Although genetic predisposition may slightly increase the risk of developing hypertension, Jiang et al. say in their 2016 review article that diet and sedentary versus active lifestyle play a much more significant role in weight gain. In fact, obesity is most commonly contributed to a specifically high carbohydrate diet, the same elevation of carbohydrates that we see in many affordable, easy to make family dinners (Jiang et al. 2016).

The development of hypertension is more dangerous than you might think. Fat sustained in the blood can “immediately” affect the functions of many vital organs, including the liver and kidneys (Jiang et al. 2016). This can lead to atherosclerosis—a condition in which the medium and large-sized arteries are compromised due to the buildup of visceral fat in the artery walls (Jiang et al. 2016). An individual is also highly likely to develop an increased number of triglycerides if suffering from hypertension (Jiang et al. 2016). Elevated levels of triglycerides significantly increase the risk of developing atherosclerosis and ultimately succumbing due to blockages in major arteries.

Another complication due to the prevalence of obesity is an increased heart mass. This is a dangerous issue because a larger heart is nearly always a telltale sign of cardiac distress. In fact, when the heart is larger, it undergoes what is known as increased isovolumic relaxation time. Essentially, the heart must work harder during each pump to do the same amount of work as a healthy heart (Faith et al. 1997). This cardiac distress is associated with the development of cardiovascular disease and a significantly increased risk of stroke because the heart is forcing out this blood into highly pressurized vessels (often) surrounded by large amounts of visceral fat. It is no easy task (Faith et al. 1997).

Another significant health complication with obesity is the self-induced Type 2 diabetes. Type 2 diabetes is a chronic condition in which, typically due to years of poor lifestyle choices, blood sugar levels are high because insulin is less effective, or no longer produced. Type 2 diabetes also significantly increases the risk of Increased Glucose Intolerance, or IGT, in women (Faith et al. 1997). This is indicated by elevated blood sugar levels and can lead to the development of Polycystic Ovary Syndrome, a condition characterized by menstrual irregularities ovarian cysts, and even infertility (Faith et al. 1997). This is just one of the many issues that can arise from Type 2 diabetes.

In a study conducted by Sushma Sharma and Sharon E. Fleming published in a journal titled *Eating Behaviors*, a community-based intervention protocol by the name of Taking Action Together (TAT) was put in place among inner-city, low income, high BMI, African American children (Sharma and Fleming 2012). This program was created with the purpose of improving nutrient intake, physical activity, and strengthening the children's self-esteem. The 89 overweight and obese children were enrolled in community-based programs that encouraged these healthy lifestyles. After only one year, it was found that many of the children had

undergone changes in their *voluntary* food intake to prefer foods with more macronutrients and less fats and carbohydrates (Sharma and Fleming 2012).

Crucial to note here is that the development of these severe risks and complications due to obesity are *not* isolated to adults. In fact, 42 million of children are overweight and/or obese worldwide (Bentley et al. 2017). While there is no “easy fix,” per say, to this issue, monitoring what goes into our children’s mouths is the primary means to prevent these issues.

Treatment

When obesity becomes such a sustained problem for individuals that serious complications begin to appear, they must seek treatment in order to improve health, symptoms, and overall quality of life. Hypertensive drugs currently on the market include RAS blockers, beta-blockers, and diuretic drugs (Jiang et al. 2016). These drugs use a variety of mechanisms to ultimately lower blood pressure and increase ease of blood flow throughout a patient’s body. Because these drugs can produce significant side effects, obese patients should seek to manage their weight by deep lifestyle changed, reduced salt and fat intake, and increased consumption of water, fruits, fresh and raw vegetables, fish, lean meats, and whole grains (Jiang et al. 2016).

Treatment of Type II diabetes is very similar to that of Type I diabetes. Patients must prick themselves or be pricked in order to test their current blood glucose levels. Additionally, they must receive synthetic insulin via injection multiple times daily in the arm or stomach in order to ensure that blood glucose levels are not high, and lower their immediate risk of heart attack or stroke. Successfully keeping up with the requirements and treatment demands of Type II diabetes in order to stay healthy is enough to keep anyone preoccupied. In order to stay relatively healthy, these patients must stay vigilant and responsible advocates for their health at all times. If they do not, some pretty severe consequences could ensue. Yet, many Type II

diabetes cases are purely unavoidable and would cease to exist if the patient's obesity had been managed before it got too dangerous. This is yet another example of why WIC is crucial in order to make the lifestyle changes needed to avoid conditions like Type II diabetes very early on in life.

Preventative Care & WIC's Role

In order to implement and benefit from preventative care, it is important to first understand what preventative care looks like in practice. There are three realms of prevention—primary, secondary, and tertiary (Faith et al. 1997). Primary prevention, the rarest form of prevention, involves nutrition education and learning about health risks before any symptoms or diagnosis occurs (Faith et al. 1997). Though the rarest form of prevention, it is arguably the most important because it holds the power to deter predisposed individuals from partaking in a sickly lifestyle and preemptively puts it to a halt before chronic disease even has a chance to develop. WIC intervention is an example of primary intervention as it provides participants with knowledge about healthy decision making even if their families are not yet obese.

The second type of intervention is known as secondary intervention (Faith et al. 1997). This is intervention that begins soon after symptoms emerge (Faith et al. 1997). A few examples of secondary intervention include school lunch programs, because once it was found that children receiving hot lunches were gaining weight, newer, healthier food programs were introduced (Faith et al. 1997). Another example of a secondary prevention was a study done by researchers to determine if amount of TV watched and rate of obesity were correlated. It was found that a decrease in TV time lead to a decrease in a child's already slightly elevated BMI (Faith et al. 1997). WIC can also serve as a mechanism of secondary prevention because doctors that examine lower-income families at wellness checks may note a child with an elevated BMI,

and suggest that the family look into WIC. The third and final type of prevention is known as Tertiary prevention. Tertiary prevention is essentially another way of saying that the patient is undergoing treatment (Faith et al. 1997). Once the patient is in the stage of tertiary prevention, the problem or diagnosis is prevalent and they are (hopefully) actively seeking treatment in order to improve their quality of life.

At the time that Faith et al.'s 1997 article was published, it was scientists' hope that prevention would play a key role in the future of childhood obesity as governmental health policy and food industry practices improve and the risks of obesity become more well-known. Today, 20 years later, there hasn't been much of a significant change. However, incremental changes are still being made that are projected to make a large difference over time. One of these incremental changes is the WIC program.

It cannot be emphasized enough how key WIC's role is in all of this. It is the direct mechanism by which many children's lives are being saved, and their bodies protected from the harm of chronic disease each and every day. It has been found that overall obesity prevalence among WIC participants has decreased to 14.5% since the year 2014 (Pan et al. 2016). In a review article written by TA Farley and D Dowell, it is suggested that childhood obesity has finally begun to "level off" after decades of countless increases, and this improvement is partially due to implementation of WIC programs (Farley et al. 2014). As previously stated, WIC provides free and healthy food to families on a monthly basis (Jacobsen et al. 2014). WIC helps prevent obesity by limiting what participants can buy to the healthiest options such as skim and 1% milk, blocks of cheese, beans, juices with at least 120% vitamin C, and cereals with minimal additives. Through WIC, canned fruits and vegetables are limited based on sugar and syrup contents while raw fruits and veggies are unlimited so long as they add up to the participant's

predetermined dollar allowance amount. Additionally, WIC attempts to implement nutrition education so that once a family has children all over five and is no longer eligible to receive WIC benefits, healthy practices will already be instilled and followed. Through this nutrition education, moms are taught how to pick out the healthiest options at the grocery store on a budget along with how much to include in a meal, when to have meals, and why it is so important to teach their kids about healthy eating so young.

WIC is also beneficial because it is a local, centralized location that women can visit in order to be provided resources needed that contribute to the overall health of their families—this includes resources on help finding a job with insurance, a reliable vehicle, or affordable and trusted childcare. One of the most important resources provided at WIC is breastfeeding education. WIC strongly encourages breastfeeding. At wellness checks, moms meet with nutritionists to take a look at baby, check blood iron levels, give mom breastfeeding advice and tips, and to attempt to solve any breastfeeding issues mom and baby may be encountering. WIC knows that breastfeeding truly is baby's best start as breastfeeding provides infants with protection from infectious diseases that the mother is immune to by a transfer of her disease-fighting antibodies (Jacobsen et al. 2014). To make breastfeeding even better, it benefits mom as it was found to be associated with decreased risk of many female cancers including cancer of the breasts and/or ovaries (Jacobsen et al. 2014).

A 2017 study conducted on over 39,000 Hispanic, WIC-enrolled infants from California shows just how key breastfeeding is to baby's overall health and health trajectory. In this study, conducted on the current most at-risk populations for obesity, the BMIs of infants that were fully breastfed, partially breastfed, and fully formula-fed were monitored until the children reached age 5. It was found that exclusively formula-fed babies were significantly more likely ($P < .001$)

to be obese between the ages of 2 and 5 (Whaley et al. 2017). Additionally, it was noted that every month of full-breastfeeding averagely resulted in a 3% decrease in a child's obesity risk (Whaley et al. 2017). Thus, it was determined that WIC's "promotion and support" of breastfeeding has a significant contribution in reducing rates of early childhood obesity (Whaley et al. 2017).

Another key study in support of WIC's ability to decrease childhood obesity risks and prevalence levels was conducted in two Massachusetts communities as part of the Massachusetts Childhood Obesity Research Demonstration (MA-CORD). In this study, WIC-enrolled children between the ages of 2 and 5 were surveyed in order to detect changes in BMI and obesity-related behaviors (Woo Baidal et al. 2017). It was found that WIC-enrolled children in both MA communities studied had decreased sugar-sweetened beverage consumption, and consequently, better sleep duration. A small decrease in BMI was also noted (Woo Baidal et al. 2017). The study concluded that WIC is associated with reduced prevalence of childhood obesity factors and an improvement in BMI scores.

Conclusion

In essence, obesity is a significant contributor to morbidity and mortality and is growing worldwide. As one of the many Americans that struggle with weight loss and maintenance, I for one can say that there is no easy fix to the problem, and once it is an issue, it is incredibly difficult to reverse. This is why preventative care is so crucial to implement early into children's lifestyles. Early normalization of healthy food choices, activity levels, and lifestyles is the absolute best way to avoid obesity and its plethora of health complications, especially in families in which being overweight is genetically predisposed.

For those that do not have the means to consistently provide healthy, nutrient-rich foods to their families on a regular basis, WIC is a wonderful and often successful means of obtaining these sources of nutrients. WIC's contribution to the slow (but steady!) decrease of childhood obesity cannot be overlooked. Thanks to its ability to provide free, healthy food, health education for pregnant and mothering women, and a wide variety of resources, it has proven itself as useful, and worthy of our time, over and over again. If used correctly, WIC has the opportunity to be a small fix that helps satisfy large, complex issue. WIC's contribution can help save lives and prevent children from setting themselves up for a life of irreparable health issues. It is in our community's best interest to protect WIC so that the prevalence of type 2 diabetes, hypertension, lipid disorders, and all of their associated complications can be avoided at all costs. Yet, by no means does WIC solve the entirety of the country's health problems—it is merely one small piece in the puzzle that is obesity, specifically childhood obesity among low-income families. There are still many gains to be made in this field in order to assure our youth (of all socioeconomic statuses and tax brackets!) are protected. In the future, it is the hope of scientists, nutritionists, caseworkers, and mothers around the globe that WIC and similar programs will be invested in more so that more families can benefit from its assistance. Additionally, it is our hope that as time goes on, less people will need to endure rigorous treatment because their illnesses and ailments will have been prevented. This will make communities, the US, and potentially the world a healthier place to live.

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