Childhood Obesity: An Overview of the Global Epidemic

Phyllis Woolford
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Introduction

The prevalence of childhood obesity has increased rapidly worldwide (Ogden, Carroll, Curtin, McDowell, Tabak, & Flegal, 2006). Globally in 2010 the number of overweight children under the age of five is estimated to be over 42 million (World Health Organization, 2010). This is of particular concern as Johnston and Mack (1978) have shown that obesity in young children is related to obesity in both adolescence and adulthood. These children are at increased risk of developing a number of obesity-related illnesses, including insulin resistance, non-alcoholic liver disease and orthopedic problems (Must & Strauss, 1999). Furthermore, their future as obese adults is likely to be marred by a higher risk of suffering from non-communicable diseases (NCDs) such as heart disease, type 2 diabetes, certain cancers, cerebrovascular disease and hypertension (Dietz, 1998). As a result of this link with many causes of morbidity, obesity is associated with increased healthcare costs and with premature mortality (Finkelstein, 2007; Hampl, Carroll, Simon, & Sharma, 2007; Woolford, Gebremariam, Clark, & Davis, 2007).

According to Ben-Sefer, Ben-Nathan, and Ehrenfeld (2009), this disturbing worldwide trend of childhood obesity is a cause for deep concern to health professionals who work with children. Consequently, many governments and health organizations have increased their focus on obesity in an effort to reverse the tide of excess weight among their constituents. In particular, the government of Trinidad and Tobago has expressed a desire to address this issue because the country was recently noted to have the fifth highest prevalence of obesity in the world.

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(Williams, 2013). This article will provide an overview of the problem, its causes, and interventions with a view to informing possible approaches to addressing childhood obesity in the Caribbean.

**Definition of Terminology**

The American Heritage Dictionary (1985) formally defines obesity as a “condition of increased body weight that is caused by an excessive accumulation of fat.” The “gold standard” means of measuring adiposity (fat cells), hydrostatic weighing, is not convenient for screening large populations. Skin-fold measurements with calipers is a more widely available technique, but this takes skilled personnel to be performed accurately and may cause discomfort, rendering it an unpopular means of assessment in primary care pediatric settings. Due to the need for an easy, accurate means to identify those with excess weight, the body mass index (BMI) has emerged as the most commonly used method of obesity screening (Pietrobelli, Faith, Allison, Gallagher, Chiumello, & Heymsfield, 1998; Whitlock, Williams, Gold, Smith, & Shipman, 2005). While some debate remains regarding the benefits of using BMI due to its inability to distinguish between excess weight resulting from muscle, as opposed to weight due to fat cells (Ellis, Abrams, & Wong, 1999), most healthcare providers believe that it is a clinically useful means to identify obese patients. Calculated by dividing weight in kilograms by height in meters², the raw BMI is used to determine the likely weight status for adults (see Table 1). However, for children, the appropriate BMI varies with age and gender. Consequently, in pediatrics, growth charts that present percentiles are used to determine the weight status (Centers for Disease Control and Prevention, 2006). See Table 1.

**Table 1: Weight Categories for Adults and Children**

<table>
<thead>
<tr>
<th></th>
<th>Adults</th>
<th>Children</th>
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<tr>
<td><strong>Normal Weight</strong></td>
<td>18.5 to &lt; 25</td>
<td>5th to &lt; 85th percentile</td>
</tr>
<tr>
<td><strong>Overweight</strong></td>
<td>25 to &lt; 30</td>
<td>85th to &lt; 95th percentile</td>
</tr>
<tr>
<td><strong>Obese</strong></td>
<td>30 or greater</td>
<td>95th percentile and greater</td>
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In an effort to understand childhood obesity trends, different countries have used their national reference data to determine percentiles and to plot appropriate growth curves (Cole, Freeman, & Preece, 1990), but many countries, lacking their own national reference curves, rely on...
U.K. or U.S. reference data. To provide an appropriate international standard, the International Obesity Task Force (IOTF) collected data from six different countries. From this pool of data, quasi-percentile curves were developed that linked to adult cut-offs of 25 and 30 kg/m² for overweight and obesity, respectively (Cole, Belliri, Flegal, & Dietz, 2000). In the absence of country-specific curves, these charts present a reasonable approach to determining the weight status of children globally.

**Global Perspectives on Childhood Obesity**

*Obesity Shaped by Global Drivers and Local Environments*

Though first noted in the United States, this obesity epidemic now affects numerous developed and many developing countries (Savoye et al., 2005), a fact that is corroborated by the World Health Organization:

> The global rise in the obesity epidemic seemed to begin almost concurrently in most high-income countries in the 1970s and 1980s. Since then most middle-income and many low-income countries have joined the global surge in obesity prevalence in adults and children. (World Health Organization, 2005)

While countries at all income levels were affected, the pattern of the rise differed along with the potential impact. In high-income countries, lower-income populations have been affected most significantly, and although the costs of obesity are substantial, the economies and health care systems have the resources to accommodate the epidemic. However, in lower-income regions, initial increases in obesity rates were noted among those in higher socioeconomic groups. As these countries experienced increases in their gross domestic product (GDP), the burden of obesity shifted across all socioeconomic groups. When compared with high-income countries, however, there is a significant potential for the sequelae (after effect of condition) and costs associated with obesity to overwhelm the health care systems of these emerging economies.

A degree of economic prosperity may be viewed as an enabler for obesity due to a network of corollary developments. For example, Popkin (1998) referred to several other transitions (e.g., demographic, technological and nutritional) that typically accompany economic growth. The implications of these developments are a shift to aging populations, urbanization, high levels of mechanization and motorization, and traditional foods giving way to more processed energy-dense foods. Many of these changes promote an obesogenic environment as larger quantities of calorie-dense foods are consumed by people who are less active.

Consequently, non-communicable diseases develop among the
increasingly obese population, resulting in health care systems with a history of facing infectious epidemics having to change their focus to treat the costly and long-term consequences of obesity-related illnesses such as heart disease, strokes and cancer. The need to concurrently address the remaining burden of under-nutrition further strains the health care situation. These factors make the necessity for interventions to reverse obesity particularly important in developing countries.

**Global Prevalence of Childhood Obesity**

The high prevalence of childhood obesity in most countries has made this a global public health priority. While obesity in children was rare in the past, there has been an exponential increase in recent decades (17% among boys and 15% among girls between 1981 and 1996), making it the most common metabolic and nutritional disease worldwide (Tremblay & Willms, 2000). Looking specifically at the U.S., where the most extensive data exist on the problem of childhood obesity, Ogden et al. (2006) have documented the changes seen in the prevalence of obesity with National Health and Nutrition Examination Survey (NHANES) data starting in the 1960s. These studies reveal that only 5% of children were obese in the late 1960s and early 1970s. However, by the turn of the century, 17% of children were defined as obese.

Ebbelung, Pawlak, and Ludwig (2002) estimated a global figure of 18 million overweight children. In this regard, Lobstein and Frelut (2003) estimated that the overweight or obese figures for European 7- to 11-year-olds was approximately 10% to 30%, and for adolescents, approximately 25%. According to Lissau et al. (2004), this represents a worrying upward trend in countries that have traditionally had low rates of overweight incidence. Table 2 presents the prevalence of overweight and obesity in children between the ages of 6 and 14 years for a range of countries.

Data for Europe as a whole generally indicate that children from Mediterranean countries have a higher prevalence for being overweight than children in northern European countries, with rates ranging between 10% and 20% (Lobstein & Frelut, 2003). Eastern European countries have not escaped the effects of this epidemic; for example, rates of obesity in Poland increased from 8% to 18% between 1994 and 2000 (World Health Organization, 2005). The Middle East also shows an increase in the prevalence of excess weight among children, with 18% noted to be overweight and 7% obese (Keinan-Boker, Noymann, Chinich, Green, & Nitzan-Kaluski, 2005; Lobstein & Frelut, 2003).

Africa has for many decades struggled with the problems of famine
and under-nutrition. While these situations continue to be a problem, many African countries are also facing the specter of an obesity epidemic. Particularly in urban centers where poverty exists, and many families have moved from consumption of traditional diets to more Western style foods, the prevalence of obesity is increasing. For example, the World Health Organization (2005) reported that 14.9% of children under the age of five in Swaziland are overweight, despite the paradox of food shortage and obesity. A similar pattern has emerged in the most populous countries in the world, such as China and India.

In the Americas, obesity has been a long-standing problem. As noted above, the United States saw a dramatic increase in the prevalence of obesity from the 1970s to the turn of the century. During this time the prevalence of obesity among children and adolescents aged 6-19 years tripled, as reflected in the results of the National Health and Nutrition Examination Survey (NHANES). Mexico has recently replaced the United States as the country with the highest prevalence of obesity; 1.5 times more Mexican-American women are obese compared to their Caucasian American counterparts (Martorell, Kettel Khan, Hughes, & Grummer-Strawn, 1998).

Meanwhile, in the Caribbean much attention is rightly being focused on the increasing prevalence of obesity in the region, because this rising obesity epidemic is one of the major underlying causes of NCDs, which are responsible for most deaths in the English-speaking Caribbean today. Data collected from the region concerning pre-school children being overweight indicate a higher prevalence than the global rates of 3.3% (World Health Organization, 2010). In Trinidad and Tobago, 25% of school-aged children (5-18 years) are overweight or obese. As a result,

<table>
<thead>
<tr>
<th>Nation</th>
<th>Age (years)</th>
<th>Percentage of overweight/obese children</th>
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<tbody>
<tr>
<td>Poland</td>
<td>11-14</td>
<td>18</td>
</tr>
<tr>
<td>Hungary</td>
<td>11-14</td>
<td>6</td>
</tr>
<tr>
<td>Australia</td>
<td>6-13</td>
<td>30</td>
</tr>
<tr>
<td>New Zealand</td>
<td>6-13</td>
<td>30</td>
</tr>
<tr>
<td>Greece</td>
<td>6-13</td>
<td>28.7</td>
</tr>
<tr>
<td>USA</td>
<td>6-13</td>
<td>25.5</td>
</tr>
<tr>
<td>Ireland</td>
<td>6-13</td>
<td>24.7</td>
</tr>
<tr>
<td>Israel</td>
<td>6-13</td>
<td>13.9</td>
</tr>
<tr>
<td>France</td>
<td>6-13</td>
<td>11.4</td>
</tr>
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</table>
NCDs like diabetes have already emerged among youth in this region (Williams, 2013).

**Disparities in Prevalence**

In many of the countries reporting data regarding the prevalence of childhood obesity, statistically significant differences exist by race/ethnicity and income. In developed countries, minority children and those from low-income families are often disproportionately affected by obesity. For example, in the United States, African American youth (particularly African American adolescent girls) have a significantly higher prevalence of obesity than other subgroups of the population; 14% of Caucasian adolescent girls are obese versus 26% of African American adolescent girls (Ogden, Carroll, Curtin, Lamb, & Flegal, 2010).

In Australia, New Zealand, and the Pacific Islands, rates of obese/overweight children are high overall and vary greatly by ethnic group. As indicated in Table 1, Australia and New Zealand rank the highest in the developed world (Barnett, 2006). The prevalence of obesity among Maori and Pacific Islander children is particularly high, with approximately 31% affected (Baur, 2006).

In Trinidad, differences in obesity prevalence also exist by demographic factors. In a study conducted at the University of the West Indies using scientific measurements similar to those used in the United States, on average, Black Tobagonian females were heavier than their peers (Selby, Anestis, & Joiner, 2008).

**Etiology of Childhood Obesity**

Childhood obesity is a multifaceted problem with several factors affecting the onset of excess weight, many of which are not fully understood. The etiology of obesity presents an excellent example of the roles of nurture and nature in disease processes (Nieman, 2004). Certainly genes play a role, but it is believed that genetic causes are rare and account for only about 1% of obesity (Nieman, 2004). However, with recent advances in science and technology, the potential exists to more fully understand and alter the genetics of obesity in the future. At present environmental factors are more readily modifiable contributors to the obesity epidemic. While environment influences the expression of genes, as studied in the emerging field of epigenetics, the greatest influence of environment in causing obesity is via its impact on diet and exercise. The basic problem involves an imbalance between “calories in” through nutrition and “calories out” via activity.
In this regard, many children are exposed to large quantities of sugar-sweetened beverages and calorie-dense foods, with at least 30% of children eating fast food at any given meal. This leads to the consumption of approximately 200 extra calories beyond their energy requirements, which results in six pounds of weight gain over the course of a year. According to Kempster (as cited by Jadavji, 2006), “over the past fifteen years the super-sized portions are increasing, along with super-sized kids with super-sized problems” (p. 2). In addition to consuming more fast food, on average most children eat fewer servings of fruits and vegetables than are recommended (King, Boyce, & King, 1999).

On the other side of this “diet-exercise” equation, we find that physical activity among children is lower than it should be. For example, in the United States, only 11% of children get the recommended 60 minutes per day of moderate to vigorous physical activity (Centers for Disease Control and Prevention, 2006). Because insufficient activity is associated with the development of overweight and obesity, children need to be taught to understand the concept of balancing “energy in” and “energy out” (Kuntzman, 2004, as cited in Jadavji, 2006). The trend away from an active lifestyle among the young has been influenced by more time spent in “screen-time” activities such as television viewing and the playing of video games. Supporting this relationship between technology and obesity, research indicates an association between hours spent viewing television and video game use and obesity (Robinson, 2001; Vandewater, Shim, & Caplovitz, 2004). The increasing access to screens, whether on computers, tablets, mobile phones or video games, has exacerbated the obesity problem. However, new technological advances also make it possible to harness these devices to increase activity through active gaming, activity monitoring, and through text messages that promote activity.

Although excess nutrition and too little physical activity constitute the basis for developing excess weight, a myriad of factors impact a child’s diet and activity patterns. The Socio-Ecological Model is often used as a framework to conceptualize these factors. This model suggests that obesity is affected by factors defined at different levels of aggregation, including Societal (e.g., government policies or social norms), Community (e.g., neighborhood safety or access to healthy foods), Organizational (e.g., gym requirements at school), Interpersonal, and Individual (Stokols, 1996). Therefore, all of these levels need to be considered when attempting to understand and impact childhood obesity in our effort to avoid its negative outcomes.
Health Sequelae of Childhood Obesity

Obese children are more likely than their normal weight peers to suffer from many medical problems during their youth, among which are insulin resistance (Must & Strauss, 1999), orthopedic problems, sleep apnea, gallbladder disease, and polycystic ovarian syndrome (Neiman, 2004). Furthermore, children who are obese are often teased and ostracized because of their weight; this can even start as early as kindergarten (Partridge, 2003). A study of obese boys showed that they are four times as likely to suffer from depression when compared to their normal weight peers. These emotional challenges appear to take their toll. To mention one illustration, Partridge (2003) found that obese children consider their quality of life “significantly impaired,” and that the degree of this impairment was similar to the effect on quality of life reported by children being treated for cancer.

Obesity in childhood is a significant risk factor for becoming an obese adult. Indeed, obesity in infancy is associated with obesity in both adolescence (Johnston & Mack, 1978) and adulthood (Charney, Goodman, McBride, Lion, & Pratt, 1976). Abraham and Nordsieck (1960) showed that the risk of an obese 10- to 13-year-old becoming an obese adult was 18:1 for females, and 6:1 for males. Moreover, children who are obese at the age of four have a 20% possibility of developing adult obesity. Garn and Clark (1976) showed that the likelihood of obesity among children having both parents with excess weight is three times that of those with two lean parents. These relationships are observed in both natural and adopted children, affirming the critical influence of the environment. Using data from Abraham and Nordsieck (1960), 80% of obese women and 55% of obese men were heavy as adolescents; these results clearly underscore that obese children are at risk for becoming obese adults who will struggle with all the attendant health problems.

Obesity among adults is associated with worsening of the comorbidities seen in children and with the long-term complications from problems such as hypertension, coronary heart disease, and type 2 diabetes (Dietz, 1998). If this epidemic of childhood and adolescent obesity continues, the next generation entering adulthood will already face a host of health problems because of their history of childhood obesity (Canadian Press, 2003), putting them at risk for greater morbidity and premature mortality. This is likely due to the positive relationship between the number of years one is obese and the likelihood of developing obesity-related illnesses. Thus, those who are obese as children are more likely to develop comorbidities as adults (Dietz, 1998). In addition,
they are more likely to suffer from complications of those illnesses at a young age. For example, it is likely that obese children who develop type 2 diabetes at a young age will also develop renal complications at a younger age than has been noted in the past.

**Obesity-Related Costs**

These health-related sequelae of obesity lead to a substantial economic burden. Finklestein (2007) estimated that $147 billion was spent in the United States on obesity-related medical expenditures in 2007. Although most of these costs are due to obesity in adults, recent studies suggest that some of these costs begin to accrue during the childhood years.

Supporting this conjecture, Wang and Dietz (2002), focusing mainly on classic outcomes of obesity like diabetes, sleep apnea and gallbladder disease, showed that the presence of these obesity-related illnesses increased healthcare costs for children in recent decades. In a similar vein, Woolford, Gebremariam, Clark, and Davis (2007) examined the hospital length-of-stay (LOS) and specific charge data for pediatric discharges where obesity was listed as a secondary diagnosis in those who were admitted for common pediatric conditions such as asthma and pneumonia. Their data also demonstrated that children with obesity accrued higher charges than those without obesity. Similarly, Nafiu, Ndao-Brumlay, Bamgbade, Morris, and Kasa-Vubu (2007) found that among pediatric patients admitted for tonsillectomy and adenoidectomy, those who were obese accumulated higher charges than those with normal weight. Finally, Hampl, Carroll, Simon, and Sharma (2007) explored the costs of obesity associated with outpatient care. Again, higher costs were found for obese children than for their normal weight peers. This underscores the impact of obesity on health care costs for children in general.

**Childhood Obesity Interventions**

**Clinical Interventions**

In 2007 the American Academy of Pediatrics (AAP) convened an expert committee (including organizations such as the American Medical Association and the American Dietetic Association), which published recommendations for the prevention and treatment of childhood obesity (Barlow, 2007). This publication outlined the types of interventions that are believed to impact obesity among children. The AAP recommends that primary care offices initiate obesity prevention. Primary care settings provide the potential for many members of staff to
participate in delivering weight management content for parents. For example, these guidelines suggest that the environment of the office should be transformed into a “healthy weight” office. This goal is well suited to nursing staff, who could ensure that posters, displays and brochures provide information about healthy eating and physical activity. In addition, nurses are often involved in weighing and measuring patients, and as such they occupy the “front line” for determining whether a patient’s weight is above the healthy range.

When prevention efforts have failed, primary care physicians have the responsibility of delivering the first level of treatment. Research has shown that primary care physicians face many barriers to addressing obesity and often do not meet treatment recommendations (Woolford, Clark, Strecher, Gebremariam, & Davis, 2008). In a study exploring physician and nurse perceptions of their treatment of obesity, providers reported low self-efficacy for treating obesity appropriately and expressed a need for greater training regarding this topic (Barlow & Dietz, 2002). Since these barriers and gaps in knowledge were identified, further research has indicated that providers continue to report low self-efficacy and several other barriers to following treatment recommendations. These include lack of support services, futility or ineffectiveness of treatment efforts, lack of reimbursement for treatment, and lack of time for providers to address all necessary issues. In other words, other topics seem to require greater priority in the short visit times allotted. In response to these findings, a number of primary care interventions to address childhood obesity have focused on improving physician practice (Perrin, Flower, & Ammerman, 2004). However, such studies have not yet demonstrated significant improvements in their patients’ weight status.

A recent study of an intensive primary care intervention (Taveras et al., 2011) found that it was unsuccessful in reducing obesity among affected children. This High Five intervention utilized motivational interviewing delivered by physicians and provided families with education about healthy lifestyle practices. While the data demonstrated some positive trends, the only significant improvement noted overall was a reduction in participants’ screen time. This limited effectiveness related to primary care interventions likely indicates the need for multiple providers to address obesity in a variety of environments and that the level of urgency possible solely through contact with primary care physicians is insufficient to achieve significant or sustained results (Taveras et al., 2011).

In recognition of the limitations of primary care services, the AAP
expert committee indicated that, for many obese children, interventions from multidisciplinary teams are often necessary. Such teams should involve a variety of professionals, including medical personnel, psychologists, dieticians, social workers and exercise physiologists. Diverse teams of this nature have the capacity to help patients address the multifaceted problems associated with obesity and thereby have a greater likelihood of promoting weight loss than can be achieved in the primary care setting. These interventions typically include weekly program visits, most of which include nutritional, exercise, and behavioral components. The expert committee recommendations also indicated that programs should monitor changes in patients’ anthropometrics and metabolic measures. However, few of these multidisciplinary interventions have published results. Furthermore, in cases where interventions have published results, the outcomes have been modest. Nonetheless, early studies of intensive family-based interventions with obese children between 7 and 12 years old (Epstein, Myers, Raynor, & Saelens, 1998) demonstrated the ability to significantly decrease BMI. In addition, the Trim Kids intervention also showed positive results for this age group, using similar methods (Sothern, Schumacher, von Almen, Carlisle, & Udall, 2002). However, these results have not been widely replicated, particularly when extrapolated to treat adolescents. In one of the largest and longest interventions to treat obese adolescents, conducted at Yale University, participants in the intervention arm increased their BMI during the course of the intervention, but their BMI increased less than those in the control group (Savoye et al., 2005). In a smaller clinical multidisciplinary intervention that included more individual therapy for participants, adolescents managed to decrease their BMI over the course of six months, but only by 2.2 BMI units (Woolford, Sallinen, Clark, & Freed, 2011).

These interventions in the United States underscore the need for novel approaches to address childhood obesity successfully, which will likely need to include a wider range of professionals than has been traditionally the case in other regions. They also suggest that at this stage there are few rigorously proven strategies that can be adopted from the United States for delivery in other settings. It is likely that adaptations and enhancements will be needed in order to utilize the lessons learned from the United States in other areas of the world.

**Surgical Interventions**

The modest results of clinical interventions to date have led to the use of bariatric surgery as an intervention to treat severe obesity when less-
invasive methods have not achieved the desired results. The number of adolescents undergoing bariatric surgery in the United States has increased over recent years as this procedure has become more readily available (Schilling, Davis, Albanese, Dutta, & Morton, 2008). Inge et al. (2010) demonstrated that bariatric surgery leads to significant weight loss and improvements in obesity-related illnesses such as type 2 diabetes, sleep apnea, and non-alcoholic fatty liver disease. However, no long-term results are available due to the nascence of adolescent bariatric surgery programs. If studies of adults are predictive of what can be expected among adolescents, then although bariatric surgery may be associated with significant health improvements for many patients, it may not prove to be the key to achieving a normal weight for most patients due in part to the need to make lifestyle changes in tandem with the surgery. Of note, one of the only two studies documenting childhood obesity treatment interventions in Trinidad is a case report of bariatric surgery on a six-year-old severely obese child (Dan, Harnanan, Seetahal, Naraynsingh, & Teelucksingh, 2010). This case study serves to suggest that less invasive interventions are needed in Trinidad to avoid the need for surgical intervention, if possible.

School-Based Interventions

Due to the percentage of time most children spend in school, schools become a natural target for obesity prevention efforts. However, school-based obesity programs have generally demonstrated only limited success. One of the most promising school-based projects to date was the Project Healthy Schools Study implemented in Massachusetts, U.S.A. (Peterson & Gortmaker, 2001). In this study, a school-based curriculum focusing on healthy nutrition and increased activity was implemented for middle-school students. While the intervention was associated with significant improvements in healthy behaviors, the results showed only a small effect on changing the weight trajectory of participants.

To date, few studies of childhood obesity interventions in Trinidad and Tobago have been published. In fact, only one report of a childhood obesity intervention in Trinidad exists. This randomized, controlled, school-based nutrition education and physical activity intervention in Sangre Grande, Trinidad, was associated with higher knowledge scores and lower intake levels of sodas, fried foods, and snacks high in fats, sugar and salt (Francis, Nichols, & Dalrymple, 2010). However, the intervention was not associated with changes in physical activity or BMI.

Although many studies document and define the problem of obesity
in the Caribbean, a broader search for childhood obesity interventions that include the Caribbean at large reveals only one additional report. In 1992 the Project Lifestyle intervention was implemented in Antigua, and a report was published describing the school-based intervention to improve eating habits, physical activity and self-concept. However, results of the intervention outcomes have not been published (Sinha, 1992). The dearth of evaluations of interventions in the Caribbean indicates the need for further work in this area.

Despite the limited success of school-based programs, schools are still viewed as an important venue for prevention efforts. It is believed, however, that to increase the likelihood of success, more stakeholders in schools, such as school nurses, school counselors, and parents, will need to be incorporated into interventions (Larrier, Bakerson, Linton, Walker, & Woolford, 2011).

There is a need for well-informed, evidence-based approaches to addressing childhood obesity; an appropriately trained nursing workforce has the potential to impact this problem. From studies exploring the role of nurses in childhood obesity prevention and treatment in clinical and school settings, we know that nurses are well placed to work with children, parents and teachers in trying to combat the issues of childhood and adolescent obesity.

**Policy-Level Interventions**

Currently, the results in obesity prevention among children worldwide have been disappointing. So far, treatment and prevention interventions have not been able to reverse the current crisis. It would seem that to truly have the required impact to reverse the trend, new interventions will be needed and existing ones strengthened at all levels. Yet currently, the main focus in the Caribbean and elsewhere appears generally to be on promoting changes in dietary practices and physical activity at the individual and group levels. There is therefore a need to widen the focus from this narrow perspective of merely inviting people to change their behavior and improve the quality of their diet and their physical activity level to creating multi-level intervention environments featuring numerous inducements to engage in behaviors that produce improved outcomes over previous efforts.

According to Ben-Sefer et al. (2009), interventions in only one sector are unlikely to have sufficient effect. Thus, policy-level changes may help to achieve wider impact, as shown in several countries. In 2006 two members of the Knesset, the Israeli parliament, proposed a new
law banning the advertisement of unhealthy food products during prime time. This proposal was included as part of the government struggle against childhood obesity. In Sweden, using cartoons to promote food to children has been banned. Comprehensive research conducted in England supports such legislation and found that advertisements of food products directly influence the behaviors of children and their food preferences (Ben-Sefer et al., 2009).

In Combating Obesity and NCDs in the Caribbean: The Policy Perspective, Henry (2007) points out that, in the Caribbean, largely educational approaches have been used to fight obesity, but that it is now important to take the next step of implementing an effective public policy strategy. In this way the whole population will experience a reduction in exposure to obesity promoting forces. He further notes that such public policy will have to accommodate certain characteristics of the Caribbean (for example, small economies with rapidly expanding liberalization of trade in food and services), and that therefore public policy strategies would need to target “drivers” of obesity in all aspects of the environment (physical, psychosocial and economic) and should be in keeping with the principles of the Caribbean Charter of Health Promotion (1993).

Henry (2007) makes some concluding recommendations for policy interventions to change diet and lifestyle in the Caribbean:

- “Regulating and modifying the food supply (to make health foods available);
- Fiscal (incentives and disincentives) (to make health foods affordable);
- Educating individuals and communities (to make healthy lifestyle choices).” (p. 3)

He then proposes a wide range of regulatory guidelines recommended at the societal level, such as legislation on nutrition labeling, advertising codes, fiscal incentives and taxation disincentives, healthy choices for fast food franchises, strengthening of regulatory bodies, food import restrictions, high-fiber food production increases, promotion of dietary guidelines and exercise habits at worksites, and the building of recreation facilities (Henry, 2007).
Conclusion
The observed increase in the prevalence of early childhood overweight and obesity between 1990 and 2010 has understandably been the result of many factors over time, including changes in nutrition, physical activity, environmental factors, social and community factors, and government policy factors.

If this increasing prevalence is not reversed, the implications are enormous for health care outcomes and expenditures in the future. Interventions so far have mainly targeted individuals and families. They are resource intensive and have limited potential for lasting success as long as environments promote unhealthy behaviors and limit access to healthy foods and safe opportunities for physical activities (Story, Kaphingst, Robison-O’Brien, & Glanz, 2008).

While there is still a need to support individual and family strategies, enhancement and expansion of public policy, directed towards environmental and population strategies, may have the greatest impact on the prevalence of obesity. Therefore, the literature suggests that, given the complexity of the obesity problem, totally removing all its causes is impossible and seeking to link it to a single cause is unwise. Thus, intervention approaches need to be informed by and focused on not primarily the individual’s biology and behaviors, but more significantly on the complex collective elements of his or her environment—social, economic and political structures and cultural characteristics. Accordingly, prevention programs with a “multi-sectoral” approach are found to be of more help in stemming the epidemic than individual weight-loss programs. Effective control of obesity requires a collaborative approach that encompasses a wide range of stakeholders addressing a variety of environments, including those in which the weight-related behaviors occur. Vital to the success of this approach will be the participation of all health professionals, educators, legislators, business people, parents and those involved in health promotion. Courageous leadership and advocacy from health professionals and scientists are required to bring about these changes.

Changing policy is a long, complex, multi-step process, involving the continual modification of existing policies and development of new policies. Influencing the many different relevant sectors can be very challenging (e.g., the transportation industry, the food industry, special interest groups, policy makers and the broader sociopolitical environment). However, attempting this monumental task, while daunting, is important to the health of generations to come.
Questions for Dialogue

1. Is it appropriate for the church to be involved with social issues like childhood obesity? Why or why not?

2. Should weight management be included in the K-12 school curriculum?

3. How can parents be helped and empowered to deal with the complex challenges of childhood obesity?

4. How can you personally become more informed about childhood obesity? Can you find a website that gives childhood obesity information for your country or state?

5. What actions can you take to join the war on childhood obesity? (check out this website for ideas: http://www.volunteerguide.org/minutes/service-projects/childhood-obesity?gclid=CNuK4d31u70CFxaMgodPnwAKQ)

6. How can you incorporate your answers to these questions into the life of your family, church or school?

References


