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Florida Public Health Review

Volume 13 Article 16

2016

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ABSTRACT

We examine current research on childhood obesity (CO) trends and intervention strategies in Florida. The fiscal, emotional, and health-related costs related to general obesity are staggering. Unfortunately, CO-related publicity, research, policy, and interventions have not been entirely successful in addressing the problem. Florida ranks 35th nationally in prevalence of CO. Data from the Centers for Disease Control and Prevention (CDC) 2013 report a statistically significant decrease in Florida's rate of CO among 2-4 year-olds participating in Florida's Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) from 2008-2011. Whereas Florida still has significant room for improvement on the issue of CO, its relatively low CO prevalence indicates a step in the right direction. Information provided herein provides valuable insight, resource information, and motivation to healthcare providers, particularly registered dietitian nutritionists (RDNs). As nutrition experts employed in various areas of society, RDNs are advantageously situated to contribute significantly to the CO solution. Florida appears to benefit from interdisciplinary collaborations among healthcare facilities, schools, faith-based organizations, governmental agencies, and grassroots programs that may play a major role in the current fight against CO.

Florida Public Health Review, 2016; 13, 128-136.

BACKGROUND

Global rates of obesity have risen to the point of becoming a new pandemic (Bagchi & Preuss, 2013). Estimates suggest that approximately 2 billion people worldwide are overweight, with one-third being classified as obese (Seidell & Halberstadt, 2015). Obesity-related diseases include heart attack, cancer, and stroke, which remain the top causes of death and disability in American adults (Centers for Disease Control and Prevention [CDC], 2016). In the United States (U.S.) alone, the prevalence of obesity has increased from 15% to 33% from 1980 to 2004 and is continuing to rise. (Bohr, 2015) Furthermore, obesity has been established as a preventable risk factor in non-communicable diseases in the U.S. with an estimated annual cost of $190 billion (Research America, 2013). Unfortunately, these costs promise to be even greater in the future, as estimates suggest that 1 in 3 Americans born in 2000 will develop diabetes in their lifetime (CDC, 2016).

Although chronic diseases such as diabetes and cardiovascular disease have been associated with later life health declines, the number of children diagnosed has tripled since 1980 (Obesity Action, 2016). The childhood obesity (CO) epidemic threatens children, one of the most valuable resources for any society. Not only does CO increase rates of childhood chronic disease, but additionally, overweight and obese children are more prone to obesity later in life. (Lifshitz, 2008). Also, CO has been linked to an increased risk of depressive and other psychological ailments resulting in decreased productivity, lost wages, and a bigger gap in health disparities (CDC, 2016; Lobstein, 2004). This highlights the major impetus to solving CO (Kumanyika, 2013).

About one-third of children and adolescents in the U.S. are either overweight or obese (Ogden et al., 2014). The prevalence of overweight or obesity (body mass index [BMI] ≥85th percentile) is 22.8% of preschool children (2-5 years), 34.2% of school-aged children (6-11 years), and 34.5% of adolescents (12-19 years) (Klish, 2015). The prevalence of obese (BMI ≥95th percentile) is 8.4% of preschool children, 17.7% of school-aged children, and 20.5% of adolescents (Klish, 2015); moreover, severe obesity (BMI that is either ≥120% of the 95th percentile or ≥35 kg/m^2) affects 2.2% of preschool children, 8.9%

of school-aged children, and among adolescents, 11.4% of girls and 9.2% of boys (Klish, 2015).

The prevalence of obesity differs by race/ethnicity. The prevalence of obesity is higher among Hispanic (22.5%) and black children (20.2%), compared to non-Hispanic white (14.1%) and Asian-American children (8.6%) (State of Obesity, 2016). Additionally, CO is more prevalent in low-income populations (Eagle et al., 2012). Children who live in lower income communities, tend to exhibit poorer dietary and physical activity behaviors, which in turn affect risk of obesity (Eagle et al., 2012).

There are signs of progress in the prevention and/ or reduction of CO in the state of Florida (Cloutier et al., 2015). Florida ranks 35th nationally in CO prevalence, and despite 33.1% of children still considered either overweight or obese, significant decreases have been reported (Eagle et al., 2012; Child Policy Research Center, 2009; Cloutier et al., 2015). Data from the CDC report Florida's rate of CO among 2-4 year olds participating in Florida's Special Supplemental Nutrition Program for Women, Infants, and Children, fell from 14.1% to 13.1% between the years of 2008 and 2011 which was a statistically significant decrease (Eagle et al., 2012; Cloutier et al., 2015). Possible cited reasons for these declines are: updates to the Special Supplemental Nutrition Program for Women, Infants, and Children; new nutrition and physical standards for early child-care programs; and also increased support for breastfeeding mothers (Eagle et al., 2012; Cloutier et al., 2015). Because WIC reaches nearly half of all infants born in the U.S., continued exploration of these types of changes may result in improved well-being for thousands of young children.

Therefore, the purpose of this review is to review the etiology of CO, Florida's current CO-related strategies to provide insight to health care providers, especially to dietitians, as to how to become successful key players in the collaborative team effort needed to combat CO. Improvement in Florida CO rates, may warrant Florida's-specific strategies to be considered as a model for other states, or even duplication and growth of successful programs within Florida communities. Success or failure of global and national strategies which have been adopted in Florida are also reported, which could prevent other communities from potentially wasting resources.

The literature search included these key terms: childhood obesity, physical activity, breastfeeding, obesity prevention, obesity treatment, obesity intervention, and Florida. Databases included the: UNF Thomas G. Carpenter Library Database, Wiley Online Library, and PubMed. The specific inclusion criteria of this review included epidemiological, observational and randomized clinical trials that are published in English.

Etiology of Childhood Obesity

Pregnancy and lactation. Fetal and early postnatal environments influence the risk of becoming obese (Wojcicki & Heyman, 2010). These findings have been replicated in animal models, showing that both maternal under- and over-nutrition can produce persistent changes in gene expression and metabolism that increases the risk of obesity later in life of offspring (Lillycrop & Burdge, 2011). Findings also suggest that altered epigenetic regulation of specific genes lead to initiation of altered phenotypes such as the thrifty phenotype (Lillycrop & Burdge, 2011; Wells, 2007). The thrifty gene phenotype hypothesis proposes that the epidemiological associations between poor fetal and infant growth and subsequent development of type 2 diabetes and metabolic syndrome result from effects of poor nutrition in early life which may contribute to changes in adult glucose-insulin metabolism (Hales & Barker, 2001). Researchers propose that this altered genetic expression in offspring as a result of exposure to poor maternal metabolic control or to maternally derived toxins has been linked to low maternal social status (Wells, 2007).

Maternal obesity and excessive maternal weight gain during pregnancy are also factors associated with increased risk for overweight or obesity in infancy and early childhood (Wojcicki & Heyman, 2010). Investigators suggest that prenatal exposure to an obesogenic environment may have epigenetic effects that program a person's long-term regulation of energy balance and may have epigenetic effects (Wojcicki & Heyman, 2010). These exposures may influence the development of hypothalamic circuits that regulate body weight, as well as endocrine pancreatic function, changes in the proportion of lean versus fat body mass, and other cycles of metabolic programming (Wojcicki & Heyman, 2010).

Early nutrition also is seen as a target for the prevention of CO (Weber et al., 2014); hence, another proposed mechanism of metabolic programming is represented by the "early protein hypothesis." According to the "early protein hypothesis" a high protein intake in early infancy is linked with a higher number of fat cells as children grow. It is thought that a high protein intake increases the release of insulin (the hormone that controls the metabolism of carbohydrates and fats) and IGF-1 (a hormone produced mainly by the liver that behaves in a similar way to insulin). Studies carried out by researchers for the Childhood Obesity Project (CHOP) in Europe and other groups support the early protein hypothesis, confirming that high protein intakes in infancy causes faster weight gain and higher body mass index (BMI) in the first years of life (Ziegler, 2016). The early protein hypothesis contends that moderate, but consistent breastfeeding, has protective effects as compared with formula feeding against later obesity

(Wells, 2007). The lower supply of protein from human milk as compared with high formula protein content might attenuate both early weight gain and later obesity in formula fed infants; thus, protein quantity may be an important factor for the observed differences (Wells, 2007). In general, insulin and IGF-I plasma concentrations are greater in formula-fed infants than in breastfed infants and IGF-I concentrations in early life, as stated earlier, have been linked to altered concentrations in later childhood and adulthood (Weber et al., 2014).

Data from randomized trials of early nutrition in healthy term infants support the growth acceleration hypothesis (Fewtrell, 2011). Infants randomized to receive growth-promoting, nutrient-enriched formula were found to have higher blood pressure and greater fat mass at 5–8 years (Fewtrell, 2011). These adverse health outcomes were linked to a faster early growth pattern (Fewtrell, 2011). The association between rapid infant growth and later life adverse health outcomes was seen in both breastfed and formula-fed infants (Fewtrell, 2011). Observational studies and randomized trials support the hypothesis that rapid early growth can be the result of a higher plane of infant nutrition, which is causally related to adverse effects on cardiovascular and obesity risk (Fewtrell, 2011). The underlying mechanism for the link between early growth and later health outcomes remains unclear (Fewtrell, 2011). However, studies submit that early accelerated growth epigenetically 'mark' set-points of hormonal axes which underpin appetite, satiety and growth, and/or on fundamental processes relating to aging (Fewtrell, 2011).

Childhood. The dietary and physical activity behaviors of youth are influenced by socio-environmental factors including families, communities, schools and childcare settings, medical care providers, faith-based institutions, government agencies, the media, and the food and beverage industry as well as the entertainment industry (Cloutier et al., 2015). CO is influenced by environmental factors, such as sedentariness and high caloric intake (Klish, 2015); however, obesity has been linked to other environmental factors, such as increased glycemic index of foods, sugar-containing beverages, increased portion size, fast food, fewer family meals, decreased structured physical activity in schools, increased use of computer-oriented play activity, school meal nutrition content, and components of the built environment, such as availability of sidewalks and playgrounds (Anderson & Whitaker, 2010; Taber et al., 2013).

Special attention has been placed on the role of sugar-sweetened beverages, as evidence has shown it can be a major contributing factor to CO (Klish, 2015). According to nationally representative population surveys among children living in the U.S., sugar-sweetened beverages provide an average of 270 kcal per day, which represents 10% to 15% of total caloric intake (Wang et al., 2008). Furthermore, The American Academy of Pediatrics recommends no solid foods or juice before 6 months of age but in the U.S., research shows 50% of 6-month-olds consume sugar-sweetened beverages or juice daily, and 65% consume solids, usually cereals (Lillycrop & Burdge, 2011). This dietary trend is not increasing the nutritional value of children's diets, but rather contributing to excess calories consumption and possible promotion of obesity.

Use of electronic devices such as TV, smart phones, and video games, commonly called "screen-time," represents other environmental factors contributing to CO's prevalence of CO (Lillycrop & Burdge, 2011). The amount of time spent watching television or the presence of a television in a child's room are both directly related to the prevalence of obesity in children (Braithwaite et al., 2013; Gilbert-Diamond et al., 2014). Suggested causation for the association between television watching/television in the child's bedroom include displacement of physical activity, decline in metabolic rate, adverse effects on diet quality, and effects of television on sleep (Lillycrop & Burdge, 2011).

PREVENTION AND TREATMENT PROGRAMS

National Prevention and Treatment Programs

The literature reports a wide range of intervention strategies and programs that help to improve BMI and other anthropometric markers, improve dietary intake and quality of life, and improve biochemical markers in children and adolescents.

Familial support and education. There is a general agreement that young children should eat meals at the family table together with other family members. This type of eating environment gives young children an opportunity to learn table manners while also learning to enjoy meals within a pleasant and safe environment. Additionally, at a very young age, children are great imitators of people they admire such as their mothers, fathers, or older siblings; therefore, programs that have focused on family meal times together with the positive promotion of healthy eating have been examined as possible solutions in decreasing the incidence of CO.

For instance, "The Family Style Management Framework" (FMSF) was developed to help families with children with chronic illnesses (Myoungock & Whittemore, 2015). A modified FMSF has been applicable to CO (Cloutier et al., 2015) and has revealed that factors (healthcare provider, social network, and financial resources as well as how a family perceives and manages a situation) within the family dynamic influence BMI (Myoungock & Whittemore, 2015).

Because in toddlers and preschool children, the family is the primary influence in the development of food habits, the "Community-based Healthy-lifestyle Intervention for Rural Preschools" (CHIRP) study and "Family, Responsibility, Education, Support and Health" (FRESH) study evaluated the effectiveness of familial weight management strategies (Janicke et al., 2013; Boutelle et al., 2015). The 2013 CHIRP study is an on-going randomized-control trial that evaluates the effectiveness of a behavioral family weight management program in 96 overweight children aged 3-6 and their parents in underserved rural areas in north central Florida (Janicke et al., 2013). The study measures BMI, child dietary intake, child physical activity and parent BMI after 12 sessions of nutrition and physical activity education with the children and adults (Janicke et al., 2013). Results are not yet available.

The FRESH, a randomized control trial, includes 150 overweight 8-12 year-olds and at least one of their parents (Boutelle et al., 2015). Participants were assigned to 1 of 2 groups: parent-only intervention or parent + child intervention. Data were collected between July 2011 and July 2015 (Boutelle et al., 2015). The study aimed to evaluate the effectiveness of parent intervention without involving the child by assessing the weight, diet, and physical activity of children (Janicke et al., 2013). The initial stages of data analysis are currently underway for this study (Boutelle et al., 2015).

Food attitudes of parents can predict food likes and dislikes and diet complexities of primary school-aged youth. Similarities between children's and parents' food preferences may reflect genetic and environmental influences; therefore, child and parent education is a theme in many studies. Five group sessions between July 2006 and July 2011 provided obese youth and their parents with information about the consequences of obesity and lifestyle modifications to decrease risk (Santiprabhob et al., 2014). In this study, the percentage of weight for height and percentage of body fat decreased significantly. The percentage of weight for height at baseline was 181.8 ± 39.1 and post-intervention it was 169.3 ± 36.3. Percent total fat at baseline was 48.2% ± 5.1% and it was 45% ± 6.8% post-intervention. Additionally, insulin resistance, lipid profiles, and transaminases levels improved. Baseline 2-hour glucose at baseline was 123.6 mg/dl ± 21.5 mg/dl and it was 114.1 mg/dl ± 20.8 post-intervention (Santiprabhob et al., 2014). Total cholesterol was 177.7 mg/dl ± 30.3 mg/dl at baseline and 168.4 mg/dl ± 27.6 mg/dl (Santiprabhob et al., 2014). The prevalence of prediabetes and dyslipidemia decreased (23 to 13 and 65 to 48, respectively) and the participants and their family members found the program to be valuable (Santiprabhob et al., 2014).

Group programs. As children grow, their world expands and their social contacts become more important. Peer influences increase with age and affect food attitudes and choices. As children mature peer-oriented nutrition education and physical activity programs have been examined as possible vehicles for the promotion of healthy eating and increased physical activities.

Example of these programs include but are not limited to "Sidekicks Team Obesity Management Program" (STOMP), the "Fit-2-Play" program and programs within the YMCA. These programs have been indicated as valuable treatment methods for obese youth (Luca et al., 2015; Messiah et al., 2015; Foster et al., 2014; Lochrie et al., 2013. Luca et al. (2015) evaluated the outcomes of adolescents participating in the STOMP program between 2010 and 2012. The STOMP program is 24 months in length and is divided into 2 parts: the first 10 weeks of the program requires children and parents to meet with the interdisciplinary team weekly for group sessions and individual check-ins (SickKids, 2014). During the second half of the program, children and parents check in every 2 weeks for the first few months initially, and then once a month (SickKids, 2014). Parents and children are also provided community resources for ongoing support (SickKids, 2014). Children and adolescents enrolled in the STOMP program did not have a significant reduction in BMI, but did show improvements in cardio-metabolic, physiological and health behavior outcomes (Luca, 2015). For example, at 6 months, children enrolled in the program had improvement in homeostatic measurement assessment-insulin resistance (HOMA-IR) (-2.7 ± 1.0), depression scores (-3.5 ± 1.7), diet readiness to change (0.6 ± 0.2), and physical activity (1.7 ± 0.9) compared to obese children not in the program (Luca et al., 2015). At 12 months participants in the STOMP program showed improvement in waist circumference (−5.9 ± 2.4 cm), HOMA-IR (−2.9 ± 0.7), and diet readiness to change when compared to obese children not in the program (0.9 ± 0.2) (Luca, et al., 2015).

The Fit-2-Play program was a longitudinal cohort study that took place over one school year (fall 2011-spring 2012) in 23 county parks in Florida and included 349 children aged 5-16 (Messiah et al., 2015). The program integrated physical activity with wellness education and participants completed pre- and post-tests (Janicke et al., 2013). The overweight/obese group significantly decreased their mean BMI z score (2.0 to 1.8) and subscapular skinfold measurements (19.4 to 17.5 mm) as well as increased aerobic endurance (10.8 to 12.5 laps in the Aerobic Cardiovascular Endurance Run test) and systolic blood pressure (58.1% participants with normal blood pressure to 71.0% participants with normal blood pressure) during one school year

(Messiah et al., 2015). Additionally, participants significantly improved their health and wellness knowledge (Messiah et al., 2015).

Programs within the YMCA have also proven to be effective improving BMI z-scores and quality of life scores (Foster et al., 2014). One intervention by Lochrie et al. (2013) conducted between 2006 and 2008 examined lifestyle interventions such as diet, education, physical activity, behavior change, and psychosocial methods on risk for associated medical conditions related to obesity. Results revealed that the intervention group involved in the program had a reduction in BMI z-scores and serum triglycerides (Lochrie et al., 2013). Children who received family based interventions also saw an additional and significant improvement in these parameters that were able to be sustained for over one year following the intervention. There was no change is psychosocial outcome data (Lochrie et al., 2013).

Physical activity in general and aerobic exercise in particular are critical aspects of treating obesity. Youseff et al. (2015) found that 3 months of an aerobic training program decreased percent fat mass (-3.4%) and hip circumference (-4.2%) and increased fat-free mass in overweight female girls (3.2%). There was also an observed decrease in caloric intake even without the use of nutritional intervention. In addition to body composition, Schaeffer et al. (2014) discovered that an 8-month aerobic training program improved white matter integrity in overweight children. From baseline to post-test, the exercise group showed a significantly greater positive change in bilateral uncinate fasciculus fatty acids when compared to the control group (left: $t(16)=2.56$, $p = .02$, 2-tailed; right: $t(16) = 2.42$, $p = .02$, 2-tailed) (Schaeffer, 2014). The exercise group also showed a significantly greater negative change in left uncinate fasciculus radial diffusivity, $t(16) = 2.21$, $p = .04$, 2-tailed (Schaeffer et al., 2014). These results suggest an increase in white matter structural coherence and myelination. Research suggests that obesity may interfere with cognitive function and academic success, fortunately, these results indicate that exercise may potentially improve brain function in overweight children (Schaeffer et al., 2014).

Intervention and Treatment Programs in Florida

To combat obesity many programs have been developed nationwide and several of those have been adopted by Florida. One such program, The Alliance for a Healthier Generation ("Alliance"), co-founded by the American Heart Association and the Clinton Foundation, has been adopted by nearly 1,600 schools in Florida (Alliance for a Healthier Generation, [Alliance] 2015). Their goals are to reduce the prevalence of CO and to empower kids to develop lifelong, healthy habits. The Alliance coordinates school wellness councils within individual school districts to oversee and help implement healthy changes within their own school system. The program's twin foci, healthier food choices and increased physical activity, target time frames when the children are both in and out of school. The program has agreements with beverage, snack foods, and dairy companies to help implement these changes. Furthermore, the Alliance also has a Healthier Generation Benefit (HGB) that compensates parents of eligible children for up to 4 visits with a Registered Dietitian. Education on the HGB is provided to healthcare professionals both through the American Academy of Pediatrics and Academy of Nutrition and Dietetics. The Alliance for a Healthier Generation is currently working on a landmark agreement to reimburse physicians and registered dietitians for obesity prevention services treatment prevention-related (Alliance, 2015).

In addition to adopted national programs, Florida has also created state specific programs that focus on the prevention and treatment of CO in Florida. "Healthiest Weight Florida" is a private collaboration of state agencies, not for profit organizations, businesses, and entire communities to help Florida's children make choices about healthy eating and active living (FloridaHealth.gov, 2015). They also partner with local business communities, hospitals, volunteer agencies and programs similar to the Alliance for a Heather Generation previously discussed (FloridaHealth.gov, 2015). The overall goal of "Healthiest Weight Florida" is to decrease the weight curve by 5% by 2017.

"Healthiest Weight Florida" has connected with the Ticket to Health program. Ticket to Health forms partnerships with family-friendly attractions to offer healthier food options for their customers. Currently, 17 Florida theme parks and zoos take part in "the healthier choice the easiest choice" Ticket to Health program (Youssef et al., 2015).

Many other health-promoting initiatives have been developed in Florida to combat childhood obesity. "Baby Steps to Baby Friendly" initiative has partnered with 27 hospitals in 15 Florida counties to enhance hospital maternity care practices that support and promote breastfeeding, a practice that helps to prevent obesity (Baby-Friendly, 2015; FloridaHealth.gov, 2015).

Moreover, Every Kid Healthy™ Week is an annual event each April with an emphasis on the link among nutrition, physical activity, and learning. International Walk to School Day encourages increased physical activity in children. Lastly, several schools in Florida have instituted Teacher Tutorial: Activities that Make Teaching Healthy Habits Fun! to help teachers incorporate health into their lesson plans (Florida.gov, 2015).

Florida's Surgeon General has been involved in the fight against CO and has implemented the "State

Surgeon General Healthy Weight Community Champion Recognition Program" (Opalinski et al., 2015). Through this program, local governments can generate and institute a variety of policies which have been shown to increase physical activity and improve nutrition (FloridaHealth.gov, 2015). By local governments applying "best practices" within their jurisdictions, they can create environments where "the healthy choice is the easy choice." This year 65 communities in Florida were recognized as Healthy Weight Community Champions.

Moreover, there are other resources available to communities in Florida and nationwide such as the Let's Move Faith and Communities Toolkit for Faith-based & Neighborhood Organizations (Opalinski et al., 2015) that focuses on the faith community as a resource and outlet for providing healthy eating education, food pantries, farmer's markets and healthy food drives (Opalinski et al., 2015).

Encouraging breastfeeding to prevent early rapid weight gain in infants helps prevent obesity and related adverse health outcomes later in life. CDC (2013a) reported that in Florida, 71.8% of infants have ever been breastfed (national average-76.5%), 40.9% of infants are breastfed at 6 months (national average 49%), and 20.0% continue to be breastfed at 1 year of age (national average 27%). In response to these statistics, the Florida Department of Health has worked to increase breastfeeding-friendly environments (CDC, 2012). By assembling an advocacy group that works on policies to support baby-friendly workplaces, a model of breastfeeding policy for school districts and state agencies has been developed and distributed. Additionally, the Florida advocacy group developed and distributed laminated signs to post alerting employees of the federal law supporting breastfeeding friendly work environment (CDC, 2012). Unfortunately, the CDC has not published a 2015 Breast Feeding Report Card; hence the results of Florida's increased breastfeeding initiatives have yet to be determined.

In addition to recommending breastfeeding to decrease early weight gain, other interventions used for children in the first year of life include minimizing sugar-sweetened beverage (SSB)/juice consumption, delaying the introduction of solids, limiting television/screen time, establishing infant routines around sleep, and recognizing infant cues to hunger and satiety (Fewtrell, 2011).

As previously stated, data from the CDC report Florida's rate of CO among 2-4 year-olds who participated in Florida's Special Supplemental Nutrition Program for Women, Infants, and Children fell from 14.1% to 13.1% between the years of 2008 and 2011 (Cloutier et al., 2015; Eagle et al., 2012). This may have been due to the changes instituted in the Special Supplemental Nutrition Program for Women, Infants, and Children in 2008, which updated their current supplemental food program to provide more fruits, vegetables, and whole grains, as well as low-fat or non-fat milk (Chiasson et al., 2016). At the same time, several states, to include Florida began initiatives to encourage breastfeeding among participating mothers, promoted physical activity, and provided strategies to reduce screen time among young children (Chiasson et al., 2016). However, findings from this report have 3 limitations. First, the children who participated in this study were limited to low-income children who participated in federal nutrition programs; hence, the findings may not reflect the obesity prevalence and trends among all low income U.S. preschool aged children or even be reflective of preschool-aged children of higher socioeconomic status (CDC, 2013b). Second, the study included 43 states/territories that consistently collected data from PedNSS, a state-based public health surveillance system that monitors the nutrition status of low-income children from birth through age 4 years; therefore trends in other states/territories may differ (CDC, 2013b). Last, due to the economic downturn that occurred from 2008-2011, the number of children in PedNSS was higher in participation in 2009, 2010, and 2011 as compared to 2008 (CDC, 2013b). Researchers are unsure of the degree to which these changes might have contributed to the declines in obesity rates for this age group. As compared to the 2008 cohort, the 2011 cohort was slightly older and included a slightly smaller proportion of non-Hispanics whites and a slightly larger proportion of non-Hispanic blacks (CDC, 2013b). It should also be noted that during this same period, national initiatives such as Let's Move, reports such as the White House Childhood Obesity Task Force Report, recommendations from nationally recognized health organizations, and media coverage have drawn increasing awareness to the problem of CO and local, state, and federal officials have been identified as major stakeholders in the prevention of early childhood obesity (CDC, 2013b).

Summary

Florida's trending improvement, despite being labeled by the CDC as part of the Southeast's "Diabetes Belt" (Barker et al., 2011), indicates that the collective state-specific strategies against CO may possibly serve as a model for other states. This comes as positive news when one considers the that global spread of obesity is outpacing prevention and treatment efforts by international health organizations such as the World Health Organization and the National Institutes of Health (CDC, 2014). Our summary is relevant to employees in many different fields, especially those working with pediatrics.

As previously indicated, the prevalence of obesity varies among age ranges, gender, ethnicity, and

socioeconomic status suggesting that many factors contribute to the etiology of CO. It has also been determined that epigenetic factors and early development programming may also influence the risk for CO. Therefore, providing prenatal and postnatal education to mothers addressing dietary and lifestyle prevention strategies early in life is crucial. Parents should be educated on the importance of maternal diet during pregnancy and lactation and also the benefits of breastfeeding over formula.

As healthcare professionals, it is necessary to consider the environmental factors such as access and availability to food and the community spaces such as playgrounds, gymnasiums, and sidewalks, and continue to lead efforts through continued development, implementation, and evaluation of obesity prevention initiatives (CDC, 2013; Schmucker, 2009). Currently, only 24.7% of Florida school age children are physically active for a total of at least 60 minutes per day CDC, 2012). In response, the Florida Department of Health has worked to increase the number of schools participating in the Safe Routes to School Walking School Bus Program. Program partners include Florida schools, PTAs, Boys and Girls Clubs, student athletic associations, community organizations, and churches to help support schools by promoting the program and being community leaders working against CO (CDC, 2012). Additionally, evaluating aspects of the home environment, such as family meal frequency and screen-time, and family structure (Chen & Escarce, 2014), may be beneficial in preventing or managing CO. Mental illness, poverty, and unhealthy cultural norms even further complicate the CO equation, making interdisciplinary programs and resources availability a necessity for nutrition professionals.

Florida's interdisciplinary multi-pronged approach is reducing the prevalence of CO in 2-4 year-old children. Various preventative and intervention based programs Florida has in place seem to be the primary drivers of success in combating CO. A common thread that connects all CO programs not only in Florida, but also nationwide, is that intervention strategies require family, school, social, and legislative intervention and support. As Florida programs have shown in the above review, collaboration between both large and small organizations are necessary to decrease the alarming rates of CO that are currently being realized. Reviewed intervention strategies suggest that the family dynamic has an influence on creating positive behavior changes that influence a child's BMI (Cloutier et al., 2015; Taber et al., 2013). Involving parents in interventions and education is essential to managing CO and initiating behavior changes (Cloutier et al., 2015). Group programs that integrate parental participation, education, and physical activity were also shown to beneficial suggesting that the group dynamic may be an essential aspect of motivation for children and adolescents (Messiah et al, 2015; Foster et al., 2014; Maggi et al., 2014). Although the reduction in prevalence of CO in 2-4 year-old children in recent years is remarkable, because majority of individual programs and interventions reviewed in this article did not report their outcomes either partially or entirely, it is very difficult to evaluate and compare their performance.

Future Directions

The complex etiology of CO is influenced by various environmental factors; therefore, it needs a comprehensive approach to address all aspects; Growing knowledge in this field helps in the development and evaluation of programs that combat childhood obesity. Research is needed in the field of nutritional genomics, and particularly, epigenetic effects of maternal diets on CO outcomes to evaluate the etiology of obesity in children and possibly into adulthood. As technology and research interests in these areas continue to grow, new and possibly more effective prevention methods may be elucidated.

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