

Overweight in Latino/ Hispanic Adolescents: Scope of the Problem and Nursing Implications

Susan Harrington

Latino/Hispanic adolescents have the highest prevalence of overweight in this country. Causes of ethnic variation may include differences in the level of acculturation, ethnic beliefs, differences in ideal body images, lack of appreciation of weight management, questionable literacy levels, and/or socioeconomic status. Improved knowledge of behavioral, social-cultural, and environmental determinants of overweight individuals among adolescent Latino/Hispanics will increase the effectiveness and direction of these interventions to prevent and treat this epidemic. Research is needed to determine which interventions may specifically be most effective for preventing this overweight status. This article summarizes variables that have an impact on Latino/Hispanic youth and identifies potential strategies for pediatric nurses to use in addressing this health matter most efficaciously.

Overweight and obesity are commonly assessed by using body mass index (BMI), defined as the weight in kilograms divided by the square of the height in meters. Overweight and obesity are labels for weight ranges that exceed what is generally considered healthy. These ranges identify weights that have been shown to increase the likelihood of certain diseases and health problems. BMI for age and gender is used as a screening tool for teens and children to identify possible weight concerns according to percentiles on the Centers for Disease Control and Prevention (CDC) growth charts. Technically, according to the CDC guidelines, there is no obesity classification term for children and teens (2 to 20 years of age). The term *at risk for overweight* represents the weight status category in the 85th percentile to less than the 95th percentile, and *overweight* represents the weight status of greater than or equal to the 95th percentile (CDC, 2007). Accordingly, *overweight* will be used as the categorical term for this weight class throughout this article.

Susan Harrington, MSN, RN, is a Continuing Care Management Coordinator, William Beaumont Hospital, Royal Oak, MI, and a Doctoral Student in Nursing, Wayne State University, Detroit, MI.

Objectives, the CNE
posttest, and disclosure
statements can be found
on pages 395-396.

Results from the 1999 Youth Risk Behavioral Surveillance System, a nationally representative survey sample of students (grades 9 through 12), indicated major disparities in BMI of ethnically diverse adolescents. More than half (55%) of the overweight population of students studied were Latinos. Additionally, proportionately more Latino students (51%) reported they were trying to lose weight as compared to the other students (CDC, 2004a). Latino boys were the most overweight of all the ethnic groups, and Latina girls the second most overweight ethnic group in the United States (CDC, 2004b). Overweight has increased among Latino children and adolescents by 120% in the past two decades (CDC, 2004a). Most recently, the rate of *overweight* has doubled among Latino youth (Goran et al., 2004).

According to statistics published in the National Longitudinal Study of

Adolescent Health (NLSAH), second and third-generation Latinos are more likely to be obese than first-generation. Latino children born outside the U.S. showed less overweight than those born in the U.S. of immigrant parents (Popkin & Udry, 1997). The NLSAH data also revealed that overweight in adolescence was linked to poor physical quality of life. Differences were significant in relation to poor general health and functional limitations (Swallen, Reither, Hass, & Meier, 2005). In addition to the correlation between being overweight and having low self-esteem and depression, many obese adolescents are socially marginalized, which may aggravate the situation (Strauss & Pollack, 2003).

The concept of ideal body weight is closely tied to cultural perceptions (Rich et al., 2005). A basic cultural attitude that helps explain high rates of overweight in Latino children is the idea that chubby children are healthy

Author's Note: Acknowledgment is made here of the ongoing debate between use of the terms *Latino* versus *Hispanic*. Recognition of the difficulty to make suppositions about a culture or ethnicity that has its origin in 22 different countries is realized here as well. Unique demographic characteristics combined with various levels of acculturation augment the differences in history and cultural background.

The term *Hispanic* was first selected by the government of the United States in the 1980 Census to monitor population statistics and compliance to Affirmative Action laws. Consequently, *Hispanic* is often seen as a government label, imposed during the Nixon Era, as a way to track the needs and concede to the injustices and prejudices of Spanish-speaking people. Conversely, Latinos do not share a common language, culture, race, religion, or political view. However, the strength of their nationality (Latin America) and community is seen in the origination of the term, *Latino*. Linguistically, Latino has gender, thereby following Spanish rules. In contrast, the term *Hispanic* follows English rules, which have no gender. In light of the overall sense of community, connection with social solace, and respect for contributions from native Latin-Americans, the term *Hispanic* will henceforth be acknowledged as *Latino* (or *Latina*) in this article unless it is within a quote or paraphrase from an outside source or study (Gines, 2006; Granados, 2000; Vazquez, n.d.).

children (Brewis, 2003). The marked dichotomy between wealth and poverty in this population is additionally reinforced by the assumption that fat children are a manifestation of the parents' prosperity (Brewis, 2003). This implicates many subtleties in addressing the significance of overweight in this population.

Adolescence represents a critical period when the likelihood of overweight may occur and consequently increase the risks of the sequel of obesity in adulthood (Dietz, 2004). As the risk of overweight and related health risk behaviors track from adolescence to adulthood, it is important to develop interventions and interrupt this course for Latino adolescents. Adolescence is a time to improve and expand on the implementation of healthy behaviors. An extensive literature review reveals interesting associations and connections in many of the causative factors of adolescent Latino overweight. The aim of this literature review is to recapitulate the variables that have an impact on the weight management of Latino youth in an attempt to add synergy to prevention and treatment programs. Pediatric nurses are often the first line of protection for this population in a variety of settings. As a trusted person, with an abundance of health information to share, the pediatric nurse is in a unique position. As an authority figure, the impact of the advice, recommendations, and initial assessments delivered have the potential to be substantial. This article will examine these contributions for the purpose of developing a framework of change amenable to targeted interventions.

Literature Review

A computer search was performed using the electronic databases of CINAHL and Medline. Keywords used in this pursuit included obesity, overweight, and Latino adolescents between the dates 1997 and 2007. Exception to the date stipulation was made when a significant piece of supporting material reached further into the past, offering significant and as of yet undisputed information.

Through an extensive review of the literature, classifications became apparent in relation to weight perceptions and overweight-contributing factors in Latino youth. *Biological, socioeconomic, acculturation, and recreational activities* were set as categories and then each appraised in relation to their respective consequences on this Latino adolescent health risk. The articles were scanned

for applicability, reliability, and validity. Saturation in content was realized among each of the categories, and substantial information was summarized and assimilated into narrative.

Possible biological contributors to overweight. Biological connotations have taken a front row in the topic of adolescent overweight in the Latino population. Overweight-related diseases seen in children include precursors of cardiovascular disease, type 2 diabetes mellitus, and sleep-disordered breathing (Daniels, 2006). Research continues to suggest a strong correlation between the inherited predispositions and the metabolic functions in the Hispanic population as they relate to the overweight epidemic.

Goran and researchers (2004) studied 150 overweight Latino children (8 to 13 years) with a family history of type 2 diabetes mellitus. The results suggested that Latino youth, with a family history of diabetes mellitus, have insulin resistance that contributes directly to the development of metabolic syndrome. Metabolic syndrome is a cluster of conditions (increased blood pressure, elevated insulin levels, excess body fat around the waist, or abnormal cholesterol levels) that occur together, increasing the risk for health disease, stroke, and diabetes mellitus (Mayo Clinic, 2007). In a second analysis from the same study, these Latino children demonstrated impaired glucose tolerance, with no direct correlation to body composition, fat distribution, or insulin sensitivity. These findings suggested that Latino children, with a family history of diabetes mellitus, suffer from pre-diabetes. This syndrome is associated with the reduced ability of the pancreas to produce enough insulin. The outcomes of this research provided evidence that the likelihood of having insulin resistance and this beta cell dysfunction does not seem to be associated only with degree of overweight in this population. It is a likely possibility that additional factors may contribute to the glucose intolerance and the poor beta cell function in these young overweight Latinos. Further longitudinal studies in this cohort will be required to identify the metabolic precursors and natural history for the development of type 2 diabetes mellitus during adolescence, but it is clear that the risk of this population for overweight and its related co-morbidities is high (Goran et al., 2004).

Further research with obese children gives evidence to the fact that they have low magnesium levels in

their blood (Huerta & Kington, 2005). Magnesium helps the body break down carbohydrates and control insulin. It is found in foods, such as fish, milk, green leafy vegetables, nuts, whole-grain breads, and yogurt. Since it has been reported that Latino's generally consume less than three or four servings of fruits and vegetables per day, they tend to run lower-than-normal blood magnesium levels (Huerta & Kington, 2005). Magnesium, however, is a double-edged sword. Not only do obese children have less magnesium in their systems, but the magnesium that they do ingest may be less effective than the magnesium in their leaner counterparts. Extra body fat can prevent the body's cells from using magnesium to break down carbohydrates (Huerta & Kington, 2005).

Adiposity and its metabolic consequences are associated with adverse changes in the arterial wall and can be appreciated as early as the teenage years. The adverse effects of arterial distensibility are becoming an important determinant of vascular disease. The graded relationships between adiposity and arterial distensibility occur well below the levels of BMI regarded as overweight in adolescents (Whincup et al., 2005). Furthermore, relative adiposity is a predictor of insulin resistance in adult life (Steinberger, Moran, Hong, Jacobs, & Sinaiko, 2001). Research indicates that a fall in insulin sensitivity in Latino children may be one factor in the pathogenesis of the progression of pediatric type 2 diabetes mellitus in this at-risk population (Goran, Shaibi, Weigensberg, Davis, & Cruz, 2006). Insulin sensitivity was independently related to adverse lipids, blood pressure, and abdominal overweight (Cruz et al. 2004).

Genetic and environmental contributions to the metabolic syndrome were established in a large cohort of Latino children participating in the VIVA LA FAMILIA study (Butte, Comuzzie, Cai et al., 2005). Insulin resistance was found to be a central contributor to the metabolic syndrome in overweight Latino children. The prevalence of the metabolic syndrome increased with the severity of the overweight. There is additional evidence that substantiates a strong genetic contribution to the components of the metabolic syndrome in Latino children. Positive genetic correlations indicate that the genes that augment glucose and adiposity are shared and also increase systolic blood pressure. Significant inheritabilities are credited

in part with the high prevalence of metabolic syndrome in overweight Latino children (Butte, Comuzzie, Cole et al., 2005).

The inheritability of the metabolic syndrome components in Latino children was also studied as it related to lipid metabolism. The dysfunctionality of the fatty acid (leptin) in the presence of excess abdominal overweight disturbs the metabolism of insulin and increases its propensity to resistance. This also appears to be an inherited pre-disposition and adds to the susceptibility and pathogenesis of cardiovascular disease and type 2 diabetes mellitus in this population (Butte, Comuzzie, Cai et al., 2005).

In a national school-based sample of obese 12th grade adolescents, it was found that non-alcoholic fatty liver disease was most common in Latino adolescents (Schwimmer, McGreal, Deutsch, Finefold, & Lavine, 2005). This study was performed in a large, regionally diverse, school-based cohort. Serum liver enzymes were tested and other causes of liver disease were excluded. The significance of this finding is reinforced by the fact that Latino adults have an increased rate of liver-related morbidity and mortality (Singh & Hoyert, 2000). Cirrhosis of the liver is three times more prevalent in Latino Americans than in European Americans (Browning, Kumar, Saboorian, & Thiele, 2004).

In a relatively small sample, young adolescent Latino children were challenged with high intakes of sugar and sugar-sweetened beverages (Davis et al., 2005). Findings demonstrated that these children exhibited lower acute insulin response (AIR) and disposition index (an index of beta-cell function). This study also verified that these young Latinos already had early signs of poor beta-cell function. With this elevated risk for diabetes mellitus, it is essential that early nutritional interventions and sugar reductions are incorporated into their daily life activities.

Socioeconomic status. Among low-income children, maternal overweight in early pregnancy more than doubled the risk of overweight at 2 to 4 years of age (Whitaker, 2004). In addition, parental overweight more than doubled the risk of adult overweight among both obese and non-obese children less than 10 years of age (Whitaker, Wright, Pepe, Seidel, & Dietz, 1997).

Latino households have disproportionately low incomes (Mazur, Marquis, & Jensen, 2003). Risk fac-

tors for health outcomes appear to be strongly related to socioeconomic status (Gortmaker, Must, Perring, Sobol, & Dietz, 1993). Socioeconomic status and acculturation are associated with the status of the child's health and dietary intake. Economic insecurity can influence food choices directly by encouraging the purchase of cheaper, energy-dense foods, as well as indirectly by producing psychosocial stress that affects parenting (Drewnowski & Darmon, 2005).

The impact of socioeconomic status indirectly influences a child's growth and development by exposure to available and relevant health care systems. Family income has a significant negative effect and may be an imperfect measure of the environment of children. However, its relationship to body weight, even in the presence of genetic influences, provides remarkably early evidence of environmental influences (Stunkard, Berkowitz, Schoeller, Maislin, & Stallings, 2004).

One should not automatically assume that the benefits of increased socioeconomic status will transfer across ethnic groups. Findings from the NLSAH suggest that efforts to reduce overweight disparities between ethnic groups must look beyond income and education and focus on other factors as well, such as environmental, contextual, biological, and sociocultural factors (Popkin & Udry, 1998). While there has been considerable research on socioeconomic status and overweight prevalence among adults, little is known about the impact of socioeconomic status on lifestyle behaviors among youth (Lowry, Kann, Collins, & Kolbe, 1996). Research shows that even if income and education were equalized, health disparities would not be eliminated (Gordon-Larsen, Adair, & Popkin, 2003). In other words, even at identical socioeconomic status levels, there are large differences in overweight prevalence by ethnicity. This suggests that disparities in overweight prevalence will not be reduced by equalizing disparities in income and education alone (Gordon-Larsen et al., 2003).

The Medical Expenditure Panel Survey Household Component supplied data for a research study (Haas et al., 2003). This study involved 8,652 families, 21,571 individuals, and 3,775 children between the ages of 6 to 17 years. Household income appeared to be related to the incidence and prevalence of overweight among adolescents. One conjecture relating income and overweight linked the type and the perceived value of

personal/family health insurance. According to this research, during adolescence, having private health insurance confirmed a protective association, and consequently, less incidence of being overweight. Adolescents with public insurance were more likely to be overweight than children with private insurance. Latino ethnicity was associated with a greater prevalence of public insurance, and as a result, a greater overweight incidence during both childhood and adolescence was observed (Haas et al., 2003). Higher rates of overweight among ethnic minority and low-income children, combined with the adverse health effects of childhood overweight, are likely to synergistically produce continued disparities in health outcomes (Kumanyika & Grier, 2006).

Acculturation. Acculturation is a subtle process whereby the behaviors and attitudes of an immigrant group undergo change as a result of contact and exposure to the new dominant culture (Pabon, 1998). The implications of this evolution bear directly on the nature of a population. These characteristics and qualities weigh heavily on the approach used by pediatric nurses. For example, 50% of Latinos living within the borders of the U.S. are functionally or marginally illiterate. Eight million of more than 17 million Spanish-speaking households were designated as linguistically isolated (Dreger & Tremback, 2002).

A research study was conducted by the Departments of Sociology, Food Science and Human Nutrition, and Economics at Iowa State University. Data were collected on 2,985 Latino youths (aged 4 to 16) from the National Health and Nutrition Examination Survey. Nutrient intake per 24-hour dietary recall was controlled for demographic, socioeconomic, and program variables. The key finding in this analysis was that limited acculturation partially ameliorated the negative association between poverty and dietary intake among Latino youths (Mazur et al., 2003). Latino youths who were less integrated into American culture were less likely to become obese even though they came from poorer socioeconomic status. Spanish language use was the measure of acculturation used in this study. Homes with Spanish-speaking parents were also associated with lower intakes of macronutrients, diets having a lower percentage of energy from fat, and with less food insufficiency. Youths whose parents had low or moderate levels of educa-

tion, however, had a higher percentage of energy from saturated fat. These results suggest that less education is directly associated with poorer food choices (Mazur et al., 2003). It is essential to identify pathways to retain positive aspects of culture. The benefits of culture-based protection appear to diminish as acculturation progresses.

Physical activity and recreational lifestyle. Overweight results from an energy imbalance, a disequilibrium, between energy intake (food/calories) and energy expenditure. The cumulative effect of energy imbalance in a susceptible individual is the development of overweight. Television viewing may promote overweight by replacing participation in physical activity (energy expenditure) or by increasing energy intake (food/calories), either during television viewing or as a result of food advertising (Gordon-Larsen, Adair, & Popkin, 2002). Among U.S. high school students, TV viewing exceeded the recommended 2 hours per day maximum according to the following cultural breakdown. Thirty-four percent of the Caucasian students, 52% of the Latino students, and 73% of the Black students surpassed the 2-hour limit on a daily basis. Latino adolescents consistently surpass the suggested media time allotment, thus adding to the predisposition for decrease in energy expenditures and increased calorie intakes (Lowry, Wechsler, Galuska, Fulton, & Kann, 2002).

Implications and Recommendations for Practice

Developing strategies for implementation of effective weight management in an ethnic population requires intentional reflection on the overweight issues that apply generally to the specific population. Consider how these issues might differ in a population with different sociocultural characteristics. A mental picture can be painted of less favorable health profiles, compounded by environmentally poor circumstances and life chances. A critical combination of partial acculturation, passive entertainment, inadequate nutritional knowledge, and genetic predisposition renders this vulnerable population of teenagers ethnically more susceptible to overweight. Easy access to highly saturated fast foods and apparent encouragement for lack of physical activity through the convenience of television and videos places this genetically predisposed insulin-resistant group in harm's way.

In essence, Latino youth have the highest rate of overweight and school dropout rate in the nation (Educational Resource Information Center, 2003). Given the literature cited here, it could be hypothesized that for this population of Latino youths, the higher the acculturation, the higher the obesity; the lower the acculturation, the higher the high school drop-out rate. The more Latino adolescents attempt to belong to this society, the more obese and inactive they become. As they retain and promote the Latino culture, as evidenced by the bilingual characteristic in the homes, the greater the likelihood that they will leave school early and remain leaner. However, further research needs to be done to explore the accuracy of this hypothesis.

The challenge for pediatric nurses is exigent, and while they may often be the first to assess and the closest to recommend, there is no set script. Understanding the innate complexities of the culture will enable enlightened implementation. Appreciating the significant elements of the Latino culture will increase the perception and effectiveness of interventions. Individuals of Latino heritage affirm significance to two main assumptions. Primarily, the importance of family interactions indicates an adherence to the value of the family unit. Involvement in relation visits and exchanges of goods and services are found to be related to familism. As a social structure, the Latino family wields a pattern of influence and control over its members. Secondly, family solidarity implies the effectiveness of internal controls in creating patterns of conventional, acceptable behaviors (Pabon, 1998). This is useful backdrop of information to pediatric nurses in creating a strategy for weight control.

Latino adolescents are likely to be influenced by the "obesogenic" environment of the U.S., particularly the sedentary lifestyles; large portion sizes; heavy advertising of high-fat, energy-dense foods; and mass media (Gordon-Larsen, Harris, Ward, & Popkin, 2003). The surplus of unfavorable influences include economic stresses; reduced access to affordable healthy foods; inappropriate opportunities for physical activity; overexposure to targeted advertising and marketing of high, empty-calorie foods; and factors related to family bionetworks. The environment works against healthy eating and physical activity. Limiting interventions to counseling Latino parents and children about weight control leans

toward the absurd and pointless.

Acculturation during adolescence may be intense and relatively accelerated, given social demands and development. The delicately overpowering peer influence may obscure what it is to be an American adolescent. Secondly, the importance of friends in this age group may make a joint venture for weight control more "appetizing." Compliance is one of the most elusive qualities of any type of weight loss program. The presence, support, and accountability of a partner speaks to the isolation, adherence, and shared physical activities. Interestingly, restricting sedentary activities was more effective than prescribing physical activities in achieving weight loss (Dietz, 2004).

Over the long term, according to recent research, one very effective way to treat childhood overweight is with the parents as the exclusive agents of change (Golan & Crow, 2004). This approach proved to be superior, especially in immigrant families, where family involvement is central. The home environment has the potential to affect children's energy balance and diet composition in numerous ways. Family-based intervention reflects a slightly different type of interventional technique and is implemented on the premise that parental support, family functioning, and home environment are important determinants of treatment outcomes. Interventions designed to target parents' feeding styles were superior to a treatment intervention directed toward the adolescent only (Epstein, Wisniewski, & Wing, 1994). Focusing on parental behaviors may be more effective than interventions directed only toward the teens. Alteration of the environment that a child is exposed to has a lasting effect (Agras & Mascola, 2005). Incorporating Latino-American culture and family relationships into an educational and behavior modification program may very well assist in reducing the risk of developing type 2 diabetes mellitus (Alters, 2001).

With this knowledge base, a tolerant plan can be customized and formulated. Pediatric nurses can encourage and instruct control of the environment, monitoring of behavior, and establishment of goals. Basically, this means adapting the particulars to the person and the situation, and then laying down a three-fold approach and foundation. Initially, the existing home, school, or environmental conditions associated with increased caloric intake and sedentary behaviors should be identified. The pediatric

nurse should assist the teenager and family in recognizing small ways to decrease calories related to types of food or serving size or simply by the elimination of particular foods. It is suggested that focusing behavior change efforts on one target, such as decreasing or eliminating the intake of sweetened beverages, may be more successful than attempts to make broader dietary changes (Agras & Mascola, 2005).

Secondly, monitoring should be implemented. This infers the use of record keeping and overseeing. Effective behavioral management requires participation by parents as well as other family members. Record keeping should be simple, possibly including check boxes, and mainly for the purpose of attentiveness to intake. Record keeping also includes the trending of weight changes with daily weights on a consistent scale. This brings us to the third support, the art of setting goals. Conditional to this concept is the formation of specific, explicit, and realistic ambitions. Pediatric nurses reviewing journal entries need to overtly and enthusiastically acknowledge all accomplishments. Rewards are an important aspect of reinforcement and encouragement.

Conclusion

Latino adolescents currently have the highest prevalence of overweight in this country. The triggers and instigators of this epidemic have been reviewed in this article. Overwhelming evidence of biologic predisposing factors appears to set this ethnic population up for failure in an environment that offers them seemingly little recourse to an "obesigenic" culture. Research indicates that there are inherited metabolic tendencies in the Latino population as they relate to the overweight. This increases their vulnerability for overweight and for obesity and its related co-morbidities. Complicating this baseline propensity are the statistics that generally place this ethnicity in a lower income bracket, higher illiteracy category, and lower educational class. The question becomes, "Why are we amazed at the fact that Latino adolescents consistently surpass the suggested daily media time allotment?"

As acculturation continues, the health risks appear to increase. For many, probably most Latinos, the process of acculturation has not benefited their state of well being. Pediatric nurses can aptly appreciate the many cultures to be assessed and addressed

– the adolescent culture, the Latino culture, and now more than ever, the obese culture.

Identification of high-risk groups offers the possibility for early intervention, with the ultimate long-term goal of rescuing vulnerable individuals from the intergenerational transfer of overweight. Pediatric nurses and nurse practitioners are in an excellent position to assist with the deceleration of this movement. Anthropometric assessments (BMI) offer a screening technique that is relatively simple, low in cost, and easy to use in the field. Yet, assimilation of nutritional knowledge and the integration of new information is a gradual process. Knowledge alone does not drive a behavior change. A successful learning situation is best accomplished when the intervention meets the need, as determined by the assessment, and the outcome is perceived as meaningful and beneficial to the participants.

References

- Agras, W.S., & Mascola, A.J. (2005). Risk factors for childhood overweight. *Current Opinion in Pediatrics*, 17(5), 648-652.
- Alters, K. (2001). Prevention of type 2 diabetes among obese Hispanic American children. *Nutritional Perspectives*, 25(3), 35-40.
- Brewis, A. (2003). Biocultural aspects of obesity in young Mexican school children. *American Journal of Human Biology*, 15, 446-460.
- Browning, J.D., Kumar, K., Saboorian, M., & Thiele, D. (2004). Ethnic differences in the prevalence of cryptogenic cirrhosis. *American Journal of Gastroenterology*, 99, 292-298.
- Butte, N., Comuzzie, A., Cai, G., Cole, S., Mehta, N., & Bacino, C. (2005). Genetic and environmental factors influencing fasting serum adiponectin in Hispanic children. *The Journal of Clinical Endocrinology & Metabolism*, 90(7), 4170-4176.
- Butte, N., Comuzzie, A., Cole, S., Mehta, N., Cai, G., Tejero, M., et al. (2005). Quantitative genetic analysis of the metabolic syndrome in Hispanic children. *Pediatric Research*, 58(6), 1243-1248.
- Centers for Disease Control and Prevention (CDC). (2004a). *Health disparities experienced by Latinos* (MMWR, Vol. 53 MM40; 935). Washington, DC: U.S. Government Printing Office.
- Centers for Disease Control and Prevention (CDC). (2004b). *Methodology of the Youth Risk Behaviour Surveillance System* (MMWR, Vol. 53 RR12; 1). Washington, DC: U.S. Government Printing Office.
- Centers for Disease Control and Prevention (CDC). (2007). *Overweight and obesity*. Retrieved August 25, 2008, from <http://www.cdc.gov/nccdphp/dnpa/obesity/>
- Cruz, M., Weigensberg, M., Huang, T., Ball, G., Shaibi, G., & Goran, M. (2004). The metabolic syndrome in overweight Hispanic youth and the role of insulin sensitivity. *The Journal of Clinical Endocrinology & Metabolism*, 89(1), 108-113.
- Daniels, S.R. (2006). The consequences of childhood overweight and obesity. *The Future of Children*, 16(1), 47-67.
- Davis, J., Ventura, E., Weigensberg, M., Ball, G., Cruz, M., Shaibi, G., et al. (2005). The relation of sugar intake to beta cell function in overweight Latino children. *American Journal of Clinical Nutrition*, 82, 1004-1010.
- Dietz, W. (2004). Overweight in childhood and adolescence. *The New England Journal of Medicine*, 350(9), 855-857.
- Dreger, V., & Tremback, T. (2002). Optimizing patient health by treating literacy and language barriers. *ACORN Online*, 75(2), 278-304.
- Drewnowski, A., & Darmon, N. (2005). The economics of obesity: Dietary energy density and energy cost. *American Journal of Clinical Nutrition*, 82(1) S265-S273.
- Educational Resource Information Center. (2003). *High school dropout rates for Latino youth*. Washington, DC: U.S. Government Printing Office.
- Epstein, L., Wisniewski, L., & Wing, R. (1994). Child and parent psychological problems influence child weight control. *Obesity Research*, 2, 509-515.
- Gines, V. (2006). *Hispanic vs. Latino*. Retrieved August 25, 2008, from <http://www.soaw.org/article.php?id=830>
- Golan, M., & Crow, S. (2004). Targeting parents exclusively in the treatment of childhood obesity: Long-term results. *Obesity Research*, 12(2), 357-361.
- Goran, M., Bergman, R.N., Quintilia, A., Watkins, M., Ball, G.D.C., Shaibi, G.Q., et al. (2004). Impaired glucose tolerance and reduced b-cell functioning in overweight Latino children with a positive family history for type 2 diabetes. *The Journal of Clinical Endocrinology & Metabolism*, 89(1), 207-212.
- Goran, M., Shaibi, G., Weigensberg, M., Davis, J., & Cruz, M. (2006). Deterioration of insulin sensitivity and beta-cell function in overweight Hispanic children during pubertal transition: A longitudinal assessment. *Journal of Pediatric Obesity*, 1(3), 139-145.
- Gordon-Larsen, P., Adair, L.S., & Popkin, B.M. (2002). Ethnic differences in physical activity and inactivity patterns and overweight status. *Obesity Research*, 10(3), 141-149.
- Gordon-Larsen, P., Adair, L., & Popkin, B. (2003). The relationship of ethnicity, socioeconomic factors, and overweight in U.S. Adolescents. *Obesity Research*, 11(1), 121-129.
- Gordon-Larsen, P., Harris, K.M., Ward, D., & Popkin, B. (2003). Acculturation and overweight-related behaviors among Hispanic immigrants to the US: The National Longitudinal Study of Adolescent Health. *Social Science & Medicine*, 57, 2023-2034.
- Gortmaker, S., Must, A., Perring, J., Sobol, A., & Dietz, W. (1993). Social and economic consequences of overweight in adolescence and young adulthood. *The New England Journal of Medicine*, 329(14), 1008-1012.

- Granados, C. (2000). *'Hispanic' vs. 'Latino.'* Retrieved August 25, 2008, from http://latinostories.com/Brown_Latino_Literature_Project/Essays/Hispanic_Versus_Latino.htm
- Haas, J., Lee, L., Kaplan, C., Sonneborn, D., Phillips, K., & Liang, S. (2003). The association of race, socioeconomic status and health insurance status with the prevalence of overweight among children and adolescents. *American Journal of Public Health, 93*(12), 2105-2110.
- Huerta, M., & Kington, M. (2005). Is a lack of magnesium related to type 2 diabetes in obese children? *Diabetes Care, 28*, 1175-1181.
- Kumanyika, S., & Grier, S. (2006) Targeting interventions for ethnic minority and low-income populations. *The Future of Children, 16*(1), 187-207.
- Lowry, R., Kann, L., Collins, J., & Kolbe, L. (1996). The effect of socioeconomic status on chronic disease risk behaviors among U.S. adolescents. *Journal of American Medical Association, 276*, 792-797.
- Lowry, R., Wechsler, H., Galuska, D.A., Fulton, J.E., & Kann, L. (2002). Television viewing and its associations with overweight, sedentary lifestyle, and vegetables among U.S. high school students: Differences by race, ethnicity, and gender. *Journal of School Health, 72*(10), 413-421.
- Mayo Clinic. (2007). *Nutritional and metabolic disorders.* Retrieved August 25, 2008, from <http://www.mayoclinic.com/health/dehydration/DS00561/DSECTION=symptoms>
- Mazur, R., Marquis, G., & Jensen, H. (2003). Diet and food insufficiency among Hispanic youths: Acculturation and socioeconomic factors in the Third National Health and Nutrition Examination Survey. *American Journal of Clinical Nutrition, 78*(6), 1120-1127.
- Pabon, E. (1998). Hispanic adolescent delinquency and the family: A discussion of sociocultural influences. *Adolescence, 33*, 941-955.
- Popkin, B., & Udry, J. (1997). *Adolescent obesity increases significantly in second and third generation U.S. immigrants: The National Longitudinal Study of Adolescent Health.* Paper presented at the meeting of the American Society for Nutritional Sciences. Chapel Hill, NC.
- Popkin, B., & Udry, J. (1998). Adolescent obesity increases significantly in second and third generation US immigrants. *Journal of Nutritional Sciences, 128*, 701-706.
- Rich, S., Dimarco, N., Huettig, C., Essery, E., Anderson, E., & Sanborn, C. (2005). Perceptions of health status and play activities in parents of overweight Latino toddlers and preschoolers. *Family and Community Health, 12*, 130-141.
- Schwimmer, J., McGreal, N., Deutsch, R., Finfold, M., & Lavine, J. (2005). Influence of gender, race, and ethnicity on suspected fatty liver in obese adolescents. *Pediatrics, 115*(5), 561e-565e.
- Singh, G., & Hoyert, D. (2000). Social epidemiology of chronic liver disease and cirrhosis mortality in the United States, 1935-1997. *Human Biology, 72*, 801-820.
- Steinberger, J., Moran, A., Hong, C., Jacobs, D., & Sinaiko, A. (2001). Adiposity in childhood predicts obesity and insulin resistance in young adulthood. *The Journal of Pediatrics, 138*(4), 469-473.
- Strauss, R., & Pollack, H. (2003). Social marginalization of overweight children. *Archives of Pediatrics & Adolescent Medicine, 157*, 746-752.
- Stunkard, A., Berkowitz, R., Schoeller, D., Maislin, G., & Stallings, V. (2004). Predictors of body size in the first 2 years of life: A high-risk study of human obesity. *International Journal of Obesity, 28*, 503-513.
- Swallen, K., Reither, E., Hass, S., & Meier, A. (2005). Overweight, obesity, the health-related quality of life among adolescents: The National Longitudinal Study of Adolescent Health. *Pediatrics, 115*(2), 341-347.
- Vazquez, R. (n.d.). *Hispanic or Latino.* Retrieved August 25, 2008, from <http://www.lasculturas.com/aa/aa070501a.htm>
- Whincup, P., Gilg, J., Donald, A., Katterhorn, M., Oliver, C., Cook, D., et al. (2005). Arterial distensibility in adolescents. *Circulation, 112*, 1789-1797.
- Whitaker, R. (2004). Predicting preschooler obesity at birth: The role of maternal obesity in early pregnancy. *Pediatrics, 114*(1), e29-e36.
- Whitaker, R., Wright, J., Pepe, M., Seidel, K., & Dietz, W. (1997). Predicting obesity in young adulthood from childhood and parental obesity. *The New England Journal of Medicine, 337*(13), 869-873.

Additional Readings

- Baranowski, T., Cullen, K., Nicklas, T., Thompson, D., & Baranowski, J. (2003). Are current health behavioral change models helpful in guiding prevention of weight gain efforts? *Obesity Research, 11*, 23S-43S.
- Crawford, D., & Ball, K. (2002). Behavioral determinants of the obesity epidemic. *Asia Pacific Journal of Clinical Nutrition, 11*(Suppl.), S718-S721.
- Giles-Corti, B., Timperio, A., Bull, F., & Pikora, T. (2005). Understanding physical activity environmental correlates: Increased specificity for ecological models. *Exercise and Sport Sciences Reviews, 33*(4), 175-181.
- Rodehorst, T. (2003). Rural elementary school teachers' intent to manage children with asthma symptoms. *Pediatric Nursing, 29*(3), 184-192.
- Villarruel, A., Jemmott, J., Jemmott, L., & Ronis, S. (2004). Predictors of sexual intercourse and condom use intentions among Spanish-dominant Latino youth: A test of the planned behavior theory. *Nursing Research, 53*(3), 172-181.
- World Health Organization. (2007). *Obesity and overweight.* Retrieved August 25, 2008, from <http://www.who.int/dietphysicalactivity/publications/facts/obesity/en/>
- Wyer, S., Earll, L., Joseph, S., Harrison, J., Files, M., & Johnston, M. (2001). Increasing attendance at a cardiac rehabilitation program: An intervention study using the Theory of Planned Behavior. *Coronary Health Care, 5*(3), 154-159.