Disparities in Obesity in Minority Populations: A Focus on Open Space and Food Environment
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Abstract

Introduction: Inequalities with respect to socioeconomic resources and physical environment can predispose people to vulnerability leading to disparities in health. In the United States, people of certain ethnic background and socioeconomic status are at a higher risk of being overweight and obese.

Clinical Goals & Clinical Problems: African-American adults, children, and adolescents have the highest prevalence of obesity in the nation. Hispanic Americans and Asian Americans have similar health vulnerabilities. Obesity is strongly associated with several chronic diseases. Narrowing the health disparity is now a national concern.

Assessment: Race, genetics, gender, and people’s lifestyle stand out as some causes of many inequalities in health, but the differences in physical and social structure of where a person live may have an effect on people’s health as well. Neighborhood context has been suggested to create racial/ethnic environmental health disparities, but the nature of how social and physical environments affect health and the magnitude of their influence are not well understood.

Implementation: This review will look at the concept of vulnerability and health disparities experienced by blacks and determine if the physical environment can mediate with health maintenance and prevent obesity. This will help us understand the barriers to health-promoting behavior and guide us in developing appropriate programs and interventions specific to this population.

Evaluation & Discussion: The evidence reviewed in this paper, that physical environment, socioeconomic deprivation, and food environment affect the health of certain racial/ethnic minorities, has implications for community organizers and builders, policy makers, and health professionals. The health of our population must evolve on health promotion and disease prevention and should include a focus on obesity prevention targeting the whole population, including Caucasians, African-Americans, Hispanics, Asian-Americans and Filipino-Americans. This can be achieved by increasing physical resources like parks and open spaces that promote physical activities and by providing equitable access to healthy and affordable food to everyone.

Keywords: obesity, BMI, physical activity, diet, exercise
Introduction

Disparities in health in the United States continue to challenge health care advocates, health care providers, and policy makers. Race, genetics, gender, and people's lifestyle stand out as some of the causes of many inequalities in health, but the differences in physical and social structure of where a person live may have an effect on people’s health as well. Neighborhood context has been suggested to create racial/ethnic environmental health disparities, but the nature of how social and physical environments affect health and the magnitude of their influence are not well understood (Gee & Payne-Sturges, 2004; Morenoff et al., 2007).

The pervasiveness of health disparities seems to affect certain population and neighborhoods. In the United States, people of certain ethnic background and socioeconomic status are at a higher risk of being overweight and obese. A growing body of literature suggests that body mass index and obesity are related to conditions of neighborhood and community food environments (Popkin, Duffey & Gordon-Larsen, 2005). The obesity epidemic has attracted attention at all levels, from general media interest to policy and practice from health and other professions including urban designers and planners. To prevent further development of chronic diseases resulting from obesity, effective intervention should be developed and implemented. There is an urgent need to understand how individuals interact with their environments. The purpose of this article is to focus on two of the many factors that can lead to obesity: physical inactivity and the influence of the food environment.

Literature Review

In the United States, one in three adults and almost one in five children and adolescents are obese – this accounts for 78 million adults and 12.5 million children and adolescents nationwide (Ogden, Carolo, Bit & Flegal, 2011). One of the objectives of Healthy People 2010 is to reduce the proportion of adults who are obese by 15%, but as of 2011, no state has met this objective (CDC, 2011). The rate of obesity has increased significantly over the past 30 years and has disproportionately affected certain racial/ethnic populations. The association between obesity and behavioral, socioeconomic and environmental factors has been widely suggested because communities with high concentration of low-income racial/ethnic minorities are less likely to have equitable access to quality facilities that promote physical activity (Kipke et al., 2007). The increased number of overweight and obese individuals is very dramatic in adults and is affecting children and adolescents as well. Among children in the United States aged 2 to 19 years, 32% are overweight or obese, with body mass indices that are above the 85th percentile for age (Lieb, Snow & DeBoer, 2009). Overweight children are more likely to become overweight adults, have significant health consequences, and risks that are greater as the body mass index increases (Dunton et al., 2009).

Obesity, defined as having a body mass index (BMI) over 30, and overweight, defined as BMI of 25-29.9, is now a national public health concern. Recent reports suggest that children and adolescents who live in multiethnic, low income, inner-city neighborhoods are at a particular risk for obesity (O’ Loughlin, 2000). During 2009-2010, blacks have the highest age-adjusted rates of obesity (49.5%), compared with Mexican Americans (40.4%), all Hispanics (39.1%) and whites (34.3%) (Ogden, Caroll, Bit & Flegal, 2011). About 80% of black women are overweight and they have a seventy percent chance of being obese as compared to whites. The Behavioral Risk Factor Surveillance System (BRFSS) shows that no state had prevalence of obesity less than 20%, twelve states had prevalence equal to or greater than 30%, and the southern states, with the highest concentration of blacks, had the highest prevalence of obesity (29.5%) (CDC, 2011).

There is overwhelming evidence that obesity is strongly associated with several major health risk factors and can lead to multiple chronic diseases such as heart disease, hyperlipidemia, high blood pressure, stroke, Type 2 diabetes, and certain types of cancer (Lieb, Snow & DeBoer, 2009). The increase in
diabetes prevalence coincides with the pervasiveness of obesity, and the marked incidence of Type 2 diabetes mellitus is believed to be largely a result of the increase in obesity levels. Overweight children are more likely to have risk factors for cardiovascular disease, including high cholesterol levels, high blood pressure, asthma, sleep apnea, and are more likely to be diagnosed with mental health disorders or bone and joint disorders than non-obese children. A longitudinal study by Thompson et al. (2007), wherein annual measurements were obtained from girls followed longitudinally between the ages of 9 or 10 and 18, then self-reported measures were obtained at ages 21-23, showed that rates of overweight increased through adolescence from 7% to 10% in white girls and 17% to 24% in black girls. In this study, 70% of obese children had at least one risk factor for cardiovascular disease and 39% of obese children had at least two risk factors.

Based on a prevalence data from the National Health and Nutrition Examination Study (NHANES) collected between 1970 and 2004, Wang et al. (2008) predicted that by 2030, 86% of adults will be overweight and 51% will be obese. For the more disadvantaged population, 96.9% of black women and 91% of Hispanics will be obese. By 2048, all American adults will become overweight or obese, while black women will reach that state 14 years ahead of everyone else. In children, the prevalence of overweight will almost double by 2030. The report of the NHANES on racial/ethnic patterns in obesity and BMI in the United States only reports data for non-Hispanic Whites, non-Hispanic Blacks, and Mexican Americans. The literature has a shortage of data on BMI and obesity among Asian-Americans, including Filipino-Americans overall, and by national origin subgroup (Crawford et al., 2001). A population survey using data from the National Latino and Asian-American Survey (2002–2003) to create nationally representative estimates of mean BMI and obesity prevalence and trended distribution of BMI by generational status found that obesity rate for all generations among Filipinos in the United States was 4.3%. The first generation Filipinos’ obesity rate was 14%, the second generation was 24%, and the third generation was 33%, twice higher compared to the third generation obesity rates of Chinese at 22%, the other Asian origin population included in this survey (Bates, Garcia, Alegría and Krieger, 2008). The result of this study estimated that the obesity rate among Asian-Americans were on average lower than the US population as a whole, but the collective estimates shrouded the degree to which obesity was increasing dramatically in subsequent generations of Filipinos, reaching levels in the third generation similar to those in the general US population.

Healthcare cost for obesity is at an all-time high. In a recent data analysis of the 1998 and 2006 Medical Expenditure Panel Surveys, Finkelstein and colleagues reported that the 37% rise in obesity from 1998-2006 added 40 billion dollars to the annual healthcare bill for obesity and estimated that the annual healthcare costs of obesity could be as high as 147 billion dollars for 2008, representing 9.1% of the nation’s annual healthcare spending (Finkelstein, Trogdon, Cohen & Dietz, 2009). This data suggests that an obese person’s medical spending is 42% higher than for a person of normal weight. Obesity accounts for 8.5% of Medicare expenditure, 11.8 per cent of Medicaid, and 12.9 per cent of private insurance expenditure.

The Centers for Disease Control and Prevention’s (CDC) recommendations for preventing and reducing the impact of obesity in communities should focus on strategies that promote exercise and physical activity in children, young people, and adults; promote availability of healthy food; support choice of healthy food; create communities where people feel safe to exercise and be more physically active; and help communities organize for change (Khan, et al., 2009). Physical activity is defined as any bodily movement produced by skeletal muscles that results in increased energy expenditure as characterized by intensity, frequency, and duration (Pahkala, 2009). In general, physical activity improves glucose metabolism and reduces body fat. Decreased or lack of physical activity can lead to overweight and obesity. Along with the burgeoning evidence of the benefit of physical activity on health, numerous recommendations for physical activity have been released.
The 2008 Physical Activity Guidelines for Americans published by the U.S. Department of Health and Human Services recommends that children and adolescents 6-14 years of age should do one hour (60 minutes) or more of moderate physical activity daily, and should do vigorous activity at least three days a week as part of their daily physical activity. Adults are recommended to do two hours and thirty minutes a week of moderate activity and one hour and fifteen minutes (75 minutes) a week of vigorous physical activity, or an equivalent combination of moderate and vigorous physical activity. Aerobic activity should be performed in episodes of at least ten minutes, preferably spread throughout the week. Additional health benefits are provided by increasing to five hours (300 minutes) per week of moderate-intensity aerobic physical activity like brisk walking, or two hours and thirty minutes a week of vigorous-intensity physical activity, or an equivalent combination of both. Adults should also do muscle-strengthening activities that involve all major muscle groups performed two or more days per week (DHSS, 2008).

Increased levels of physical activity are strongly associated with lower BMI. Data from a 1999 CDC Youth Risk Behavior Survey on high school students showed BMI to be significantly lower in those participants who engaged in at least moderate physical activity (Eisenmann, Bartee & Wang, 2002; Humpel, Owen & Leslie, 2002). There is also overwhelming evidence of the value of regular physical activity in the primary and secondary prevention of several chronic diseases not only obesity, but conditions such as cardiovascular disease, diabetes, cancer, hypertension, depression, osteoporosis, and premature death as well (Warburton et al., 2006).

Food Environment

Neighborhood is identified to be a variable in food environment. In the past decade, researchers who were interested in the effects of cardiovascular disease and insulin resistance began to examine the effects of neighborhood on the disease process (Diez-Roux et al., 1997). This was made possible by the contribution of a new conceptual model put forward that obesity is an environmental issue and not a matter of individual weakness or a lack of self control (Poston & Foreyt, 1999). Cognitive food choices by an individual can be influenced by the food environment, which is related to aspects of the built or human-made environment such as access to restaurants, grocery stores, food availability, price, and quality (Moore & Diez Roux, 2006). These resources have a potential impact on individual-level behavior as it relates to the quality of the choices and decisions an individual makes regarding what to eat.

Residents of neighborhood communities with ready access to supermarkets and healthy foods have more healthful diets and increased intake of fruits and vegetables; access to fast food restaurants was positively associated with increased obesity (Sallis, 2009). Urban residents, particularly inner-city, poor neighborhoods are less likely than suburban residents to have access to full-service supermarkets (Bolen & Hecht, 2003). The Food Desert study conducted to calculate the extent of this problem nationally determined that 23.5 million people cannot access a supermarket within one mile of their home and showed remarkable consistency that people living in low-income neighborhoods and rural communities, especially those who do not have good transportation, face much greater challenges finding healthy foods (USDA, 2009). This forced inner-city residents to depend on smaller groceries and convenience stores that tend to have a limited selection of healthful foods and at higher prices. States in the country that ranked low in obesity tended to have more residents per fast-food restaurant than states that ranked higher in obesity (Kipke et al., 2007), and children who lived in communities with expensive fruits and vegetables were more likely to gain excessive amounts of weight than children who lived in areas where fruits and vegetables were cheaper (Sturm & Datar, 2005). A cross-sectional study of four U.S. cities found that predominantly white neighborhoods have significantly better access to low-cost quality food sources such as fresh fruits and vegetables at supermarkets than do black neighborhoods that were matched on socioeconomic status (Popkin et al., 2005).
While an individual choice, the selection of what to eat remains to be the primary determination of health and obesity. We now have significant research to show the disparity in access to healthy supermarkets over access to unhealthy fast food restaurants (Zenk et al., 2005), and the Federal government has determined the disparity in access to healthy food environments according to race, but the cause of the disparity remains an area that needs further investigation (Baker et al., 2006). While race appears to be an indicator for infrastructure access disparity in food environment, it is not a problem restricted to the black community; the Hispanic population is also subjected to the effects of unhealthy food environments. In East Los Angeles, California, young Hispanic children have more ice cream and candy stores within walking distance from their school playground facilities, as compared to their white school children counterparts (Kipke et al., 2007).

Physical Activity and Open Space Access

Open spaces and parks have been widely acknowledged as an important setting for physical activity. Socio-ecologic models of physical activity promotion emphasize how the built environment facilitates or restricts opportunities for exercise. Built environment may be unfamiliar to many clinicians, but with the high prevalence of childhood overweight and obesity, health policy makers are finding that the subject is becoming more relevant (Handy, Boarnet, Ewing & Killingsworth, 2002). The community environment may have a great impact on the health behaviors of children and adolescents as they spend more time in their home environment. Communities with ready access to parks and other recreational facilities could increase the children’s physical activity by increasing their motivation to be active outdoors (Roemmich, et al., 2006). Neighborhood parks and recreational facilities also provide a place to meet for parents with young children and increase the parents’ activity as well. Other studies also suggest that park features such as presence of paved trails, wooded areas, and park size may also be correlates of park-related physical activity (Kaczynski, Potwarka & Saelens, 2008).

The community in which a child lives can have a significant effect on his level of physical activity. The association between parks access and physical activity varied by race/ethnicity, urbanicity, housing type, neighborhood safety, and income (Babey, Hastert, Yu, & Brown, 2008). There are also disparities in levels of physical activity existing among population groups. Davis (1998) reported that the proportion of the population reporting no leisure-time physical activity is higher among blacks and Hispanics than whites, and higher among lower income people, with all types of activity declining remarkably as age or grade in school increases. Kim et al. (2002) suggest that levels of physical activity among adolescent girls in the US declined sharply, so that by age 18- and 19-years of age, the majority of the girls are not engaged in habitual physical activities other than those performed in high school. The study also showed that by 17 years of age, 65% of black girls reported no habitual leisure-time activity compared to 31% of the white girls, and a higher body mass index was associated with greater decline in activity among girls of both races. Adolescents who lived in areas with available facilities for exercise and physical activity were 26% more likely to be active than those who lived in areas without any facilities and were 32% less likely to be overweight (Lieb et al., 2009).

Nursing Implications

The availability and accessibility of open space for physical activity and the affordability of quality food for everyone are important factors in slowing the obesity epidemic. Because of the high prevalence of obesity and its comorbidities in adults, children, and adolescents in the US, especially among African-Americans, obesity prevention and initiatives to change environments that promote improved nutrition and/or physical activity should be a high priority for nurses and other health care providers. Recent research strongly suggests that overweight and obesity result from the interaction of individuals with their environment. Therefore, when planning an intervention, nurses need to implement an environmental approach to obesity prevention which focuses on the changeable aspects of the environment. The community-based environmental change interventions take into consideration all the various envi-
environmental dimensions that influence obesity, which include the structural/built environment (i.e., food and physical activity choices), economic, social/cultural, and policy environments or structures.

As leaders and educators in the community, nurses should be at the forefront of obesity prevention. They can influence nutrition and physical activity policies and help change the community environment by engaging in advocacy efforts and working with community leaders, policy makers, other healthcare professionals, and members of the community. In their clinical practice and as community policy advocates, nurses need time, resources, training, and institutional support to improve their ability to communicate and implement obesity prevention strategies.

Nurses are able to investigate and find effective and sustainable solutions to alleviate the substantial barriers that confront health care providers when making progress in preventing obesity in clinical practice, i.e., lack of adequate referral networks such as nutrition counseling, inadequate places to engage in physical activity, and lack of time to get involved in advocacy. Nurses engage in advocating for health care reimbursement and improved insurance coverage for obesity prevention services like nutrition interventions, physical activity promotion, and clinical services. Nurses can encourage communities and their leaders to build better relationships with insurers and run cost/benefit studies to support the need for preventive services and their effectiveness, which can serve as tools when the community strives to educate insurers about the obesity epidemic.

While the focus is slowly shifting to environmental infrastructure for preventing obesity, advanced practice nurses (APNs) play a role in policy related to obesity prevention through a number of other initiatives: heighten community awareness of the obesity epidemic; focus on individualized plan of care for obese patients; examine the concept of obesity prevention clinics and follow-up visits in high-risk communities; collaborate with the other members of the healthcare team (e.g., physicians, dieticians, physical therapists); and, conduct community participatory research.

There is a need to collect sufficient data to support the efficacy of environmental approaches to obesity prevention. It is necessary to conduct relevant nursing research in the various environments where people live, work, play, attend school, and receive health care – factors that have an effect on their ability to obtain nutritious foods and access to opportunities for physical activity.

Nurses are viewed by community members as trusted sources of health-related information. They can disseminate clinical obesity-prevention messages and provide evidence-based education on the effects of obesity and its resulting comorbidities. Nurses should be able to evaluate the effectiveness of health education. Nurses are in the community not only to educate, but to measure health data before and after any education interventions and identify barriers to its effective implementation. Nurses should increase its focus on educating the family as a unit, not just the specific patient with obesity issues. Nursing curricula should emphasize holistic approaches and community health in the overall goal of improving health, reducing healthcare costs, keeping patients out of acute care settings, and reducing persistent public health concerns, including obesity.

Conclusions

The evidence reviewed in this report that physical environment, socioeconomic deprivation, and food environment affect the health of certain racial and ethnic minorities has implications for community organizers and builders, policy makers, and health professionals. The health care of our population must evolve on health promotion and disease prevention and should include a focus on obesity prevention. This can be done by increasing our focus on physical resources that promote physical activity like access to parks, pedestrian walkways, and equitable access to healthy and affordable food for everyone. For inner-city residents, open space must be safe from crime and free from pollutants to attract residents.
to converge and engage in physical activity. There is a need to sharpen and intensify national focus on health disparities and mitigate the health status gap in this country. Strategies and initiatives should attempt to study and take action to address the increasingly complex health issues of racial and ethnic minorities. To truly succeed in alleviating or eliminating health disparities in minority populations, government agencies, educational institutions, foundations, health professionals, and social and civic organizations should have a concerted effort to address identified issues linking the environment’s effect on health.

With the high obesity rate of the third generation Filipinos in the United States, future research should investigate overweight and obesity among Filipinos and other Asian minorities in the United States for all age groups and genders, and examine factors that influence these. Findings from these studies will help us target disease prevention approaches to eliminate health disparities in minority populations, including those of Asian-Americans.

References


