

A REVIEW OF OBESITY AND ITS RELATIONSHIP WITH THE BUILT ENVIRONMENT: IMPLICATIONS FOR HEALTH EDUCATORS

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Abstract

Obesity is an important worldwide public health problem. Obesogenic environments have been associated with increasing rates of overweight and obesity. The relationship between obesity and the built environment, along with its implications for health education are discussed in this article.

Key words: *Childhood obesity, Built environment*

Introduction

The World Health Organization (WHO) has indicated that the epidemic of overweight and obesity should be a priority for all nations around the world. Over nutrition has been associated with the increased risk of non communicable diseases such as heart disease, diabetes, stroke, and hypertension.¹

The process of urbanization and industrialization have been linked to changes in dietary patterns, reduced levels of physical activity, and increased patterns of television watching, particularly among children.¹ This article addresses the influence of the built environment on the increased rates of overweight and obesity. A carefully planned built environment has been identified as an important element to combat this epidemic.

This article is the result of an oral presentation at the 5th Trilateral Conference on “Pan-Pacific Cooperation and Sustainable Growth” held in Seoul, Korea from May 2-4, 2006. The Trilateral Conference is an educational event that takes place every two years under the coordination of three sister universities. These universities are California State University-Fresno (USA), Beijing Union University (China), and Konkuk University (Korea). This conference promotes cooperative educational efforts between China, Korea, and the US. For this reason, this article will provide specific information on the obesity trends in these three nations.

Obesity Rates

Obesity around the World

The WHO classifies overweight and obesity based upon Body Mass Index (BMI) parameters. BMI is defined for adults as the weight in kilograms divided by the square of the height in meters (kg/m²). Worldwide, overweight is defined as a BMI over 25 kg/m² and obesity is defined as a BMI over 30 kg/m².¹

For children, the term obesity is no longer used to avoid stigmatization associated with it. According to the US Centers for Disease Control and Prevention (CDC), children are classified as “overweight” when they have an age and gender-adjusted BMI at or above the 95th percentile. They are considered to be “at risk for overweight” if they have an age and gender-adjusted BMI above the 85th and below the 95th percentile.² The WHO Child Growth standards for infants and children up to age 5 have provided a

worldwide framework for defining obesity in children.¹

The WHO has indicated that obesity has reached epidemic proportions worldwide. It is estimated that there are more than one billion people affected by overweight issues worldwide and 300 million of them are obese. Overweight and obesity have been identified as major determinants in the increased rates of type 2 diabetes, cardiovascular disease, hypertension, strokes, and certain forms of cancer.¹

WHO indicated that by the year 2020 non-communicable diseases will be the leading causes of morbidity and mortality around the world. These diseases are highly influenced by dietary patterns and environmental conditions. Chopra and Darnton³ added that the increasing consumption of refined foods, meat, and dairy products high in saturated fat have contributed to the rise in obesity and communicable diseases.

The 2002 World Health Report listed overweight as the fifth major risk factor for morbidity and mortality in industrialized nations. This report also documented the increase in the rates of overweight and obesity-related problems in countries in which hunger is endemic. As mentioned in this report, the incidence of obesity and overweight in Eastern and North African women is higher than for women in the United States. This report indicates that obesity is no longer a problem in high socioeconomic segments but is becoming a marker in economically-challenged nations.³ Countries such as China and Japan have obesity levels of 5% or lower, as compared to urban Samoa in which over 75% of the population is obese or overweight. However, even in countries such as China, rates can be of 20% or higher in urban areas.¹

Obesity in Korea, China, and the United States

It is estimated that ten million adults are overweight in Korea, with an increase rate of 400,000 a year. Overweight and obesity have become a major problem in Korea with about 15% of people under 20 being overweight.⁴ The same data showed that overall 30.6% of Koreans were overweight and 36.2% had abdominal obesity in 2001. The Korean National Nutrition Survey documented an increase in the prevalence of obesity from 20.5% in 1995 to 26.3% in 1998.⁵ It was estimated that about 950 million dollars, which corresponds to 0.25% of Korea’s gross domestic product and 4.9% of total medical costs in Korea, are associated with overweight-related problems.⁴

China's national survey on diet, nutrition, and diseases, conducted from 1992 to 2002, revealed that overweight and obesity are becoming significant problems in China. This survey found that 7.1% of Chinese adults (60 million) are obese and 22.8% (200 million) are overweight. Since 1992, overweight prevalence rates in China have increased 39% and the prevalence of obesity has increased 97%. Obesity is a problem particularly affecting Chinese cities. An estimated 12% of Chinese adults and 8% of children in urban areas are classified as obese.⁶

In the United States, overweight and obesity are also significant public health concerns. According to data from the National Center for Health Statistics, 30% of US adults 20 years of age and older, which corresponds to over 60 million people, are obese. The percentage of young people who are overweight has more than tripled since 1980. Over 9 million people between the ages of 6 and 19 are considered overweight.⁷ The prevalence of obesity has been found to be higher in non-Hispanic black (36%) and Mexican American women (33%), as compared to non-Hispanic white women (22%).⁸

According to WHO¹, obesity accounts for as high as 7% of the total health care costs in developed countries. Factors such as unhealthy environment, rapid urbanization and industrialization leading to a decrease in physical activity, frequent eating at fast food restaurants, increased consumption of high energy-dense and nutrient-poor foods with high levels of sugar and saturated fats, as well as changes in cultural dietary patterns, have been associated with the increasing rates of overweight and obesity in Korea, China, and the United States.

The Built Environment and Obesity

The built environment has been traditionally defined as the combination of conditions such as urban design, land use, public transportation, and the availability of options for people living in a particular region.⁹ Booth, Pinkston, Walker, and Poston¹⁰ have mentioned additional elements such as public policies, as well as populations' behavioral and social factors.

The built environment is related to obesity by influencing physical activity and dietary patterns. Booth, Pinkston, Walker, and Poston¹⁰ indicated that environments with limited number of recreational facilities, safety problems, uneven and hilly terrain, or insufficient lighting can limit physical activity. In addition, the presence of fast-food restaurants and

convenience stores, which are important elements in the built environment, may stimulate the consumption of high fat foods. Morland, Wing, Diez-Roux, and Poole¹¹ have documented that economically-challenged neighborhoods tend to have limited availability of healthy food choices. According to these authors, it is estimated that poor neighborhoods have three times fewer supermarkets and have more fast-food restaurants and convenience stores as compared to wealthier neighborhoods.

A built environment that increases the likelihood of obesity and overweight has been described as "obesogenic environment." This environment is characterized by the presence of multiple fast food restaurants, unplanned urbanization, and limited availability of healthy foods. Obesogenic environments have increased significantly worldwide.³

The presence of multiple fast food restaurants is an important component of an obesogenic environment. In the U.S. for instance, there are 170,000 fast food restaurants and three million soft drink vending machines. In Asia, the rapid spread of fast food restaurants is also evident.³

Unplanned urbanization is associated with a rapid growth without health planning. A lack of an environment conducive to exercise is an example of unplanned urbanization. Modern societies are characterized by reduced space for outdoor activities and limited recreational opportunities. To compensate for this, people tend to rely on indoor activities, such as watching television, for recreation. Introduction of television into the homes has been found to negatively influence people's patterns of physical activity and energy expenditure, and therefore contribute to increase of risk for obesity.¹

WHO has added that the lack of available healthy foods is related to the epidemic of obesity.¹ Nutritional and international trade issues are of important concern when analyzing the influence of the built environment on obesity and overweight. International food trade is mentioned by Chopra and Darnton³ as a major factor influencing the rate of overweight and obesity worldwide.

Sustainable Development and the Built Environment

Sustainable development is the philosophical framework for the creation of environments conducive to health. Built environments that decrease the incidence of overweight and obesity have been

promoted by international advocacy efforts as related to sustainable development.

The United Nations (UN) established a commission on sustainable development at the 1992 UN general assembly as a follow-up of the UN conference on Environment and Development, commonly known as the Earth Summit. This commission is in charge of providing vigilance in the fulfillment of the implementation of Agenda 21 and the Rio Declaration on Environment and Development, as well as providing worldwide policy guidelines on sustainable growth at the local, national, and international levels. The Division for Sustainable Development is part of the UN Department of Economic and Social Affairs and its logo is "Development that meets the needs of the present without compromising the ability of future generations to meet their own needs".¹²

The 2002 World Summit on Sustainable Development took place as a follow-up to the 1992 Earth Summit. The 2002 summit attempted to address issues such as worldwide poverty, a progressively deteriorating environment, and the need to establish international partnerships that promoted sustainable growth. Sustainable growth in the context of this summit was aimed to increase the number of people with access to basic sanitation and reduce the presence of unhealthy environments. Sustainable development was defined by the United Nations as the integration of environmental, economic, and social decision-making forces in a community.¹³ The World 2002 Sustainable Development summit called for the translation of sustainable growth principles into national policies and strategies. As part of this effort, the United Nations Millennium Declaration delineated policies aimed towards reaching the goals of world environmental sustainability and health promotion.¹²

Worldwide programs are being developed to respond to the call for Sustainable Development and the decrease of obesogenic environments. In the European Community (EC), the Fifth Framework Program to promote competitive and sustainable growth has supported research on identifying areas for worldwide collaboration and promoting cross-sector projects for technology uptake and innovation.¹⁴ In the United States, the 1996 Sustainable Growth Initiative of Sedona, Arizona served as an example of how policy and practice on sustainable development can be integrated. In Sedona, Arizona, a limited number of building permits were issued yearly with the goal of protecting the environment.¹⁵

The Integration of the Built Environment and Sustainable Development in the Control of Obesity

The obesity worldwide epidemic can not be controlled only through people's reduction of personal risk factors. The adoption of healthier lifestyles should be reinforced by healthy environments. Chopra & Darnton³ suggested that obesogenic environments could be positively altered through clear food labeling and public education. The United Nations Educational, Scientific and Cultural Organization (UNESCO) launched a 10-year-long worldwide advocacy program on public education for Sustainable Development in 2005. This initiative, to be developed from 2005 to 2014, is based on the principle that through exploration and dialogue, environments could stimulate people towards the adoption of behaviors and practices that enable them to live a full life without being deprived of the basics.¹⁶

A built environment designed on the principles of sustainable growth and culturally-sensitive industrialization is a key element in creating healthy conditions. Designing areas with high connectivity and multiple pedestrian access points, as well as reducing the presence of fast food restaurants in key locations such as proximal zones to elementary and high schools have been suggested by Booth et al¹⁰ as effective tools to combat the worldwide obesity epidemic. These authors have also suggested that the creation of safe neighborhoods, with commercial and recreational facilities, result in increased physical activity and social capital, which ultimately reduces the risk for overweight and obesity.¹⁰

Public policy has also been described as an essential element in creating a healthy built environment. Health policy initiatives to eliminate the sale of junk foods and soft drinks in schools, as well as limiting the fat and sugar content of foods sold in public schools, have been welcomed in some regions of the United States.¹⁷

The US food industry spends more than \$30 billion US dollars each year on mass media advertising.³ The Institute of Medicine (IOM) has made a call to the US congress to produce legislation that blocks the presentation of high-calorie and low-nutrient foods during children's television shows.¹⁷ In addition, restrictions have also been suggested by the IOM in regards to the use of cartoon characters such as Scooby Doo and SpongeBob to market unhealthy food choices.¹⁷ In this context, the WHO has indicated that the World Trade Organization (WTO) has a major role in creating mechanisms to facilitate the penetration of healthy foods and global

advertising in developing countries.³ Wiard¹⁸ added that television may be used in disseminating information about the prevention, screening, and treatment of chronic diseases and their risk factors such as overweight and obesity.

The fifty-fifth World Health Assembly proposed the international analysis of advertising, mass communication, world trade agreements, food labeling, urban planning, and transportation as key strategies to promote healthy food choices and physical activity.¹ The WHO Process for a Global Strategy on Diet, Physical Activity and Health made a call to food, sports, insurance, and advertising industries to endorse nutritional messages and create healthy products that contain less harmful nutrition-based components.³ The Codex Alimentarius, administered by the WHO and the Food and Agricultural Organization (FAO), contains standards and ideal codes of practice aimed at protecting international consumers' health.³ This code can serve as the basis for international cooperation in producing food marketing standards and guidelines to reduce overweight and obesity.

The relationship between sustainable development and obesity is evidenced in the need for preserving an environment free of obesity risk for future generations. This can be exemplified in the efforts embarked by vegetarian people, since vegetarian diets tend to preserve the environment and to pose less risks associated with caloric intake. Sustainable development reduces the risk of obesogenic environments for future populations.

Implications for Health Educators

Health education studies the influence of health behavior on morbidity and mortality patterns. Health behavior is certainly a major contributor in controlling overweight and obesity. The presence of unhealthy environments, mass media advertisement, inappropriate health policies, and international trade patterns have also been identified as important contributors in the world-wide increase of obesity. A healthy environment promotes healthy behaviors.³ Health educators have a fertile ground in exploring their role in promoting and advocating for environmental conditions supportive of healthy lifestyles.

Health educators are also called to raise awareness about the existence of obesogenic environments and the need for creation of national and international health policies conducive to control and reduction of

overweight and obesity. An example of such participation can be illustrated in the active role that health educators can play in international events such as the "World Health Day" promoted by the WHO and the "National Public Health Week" in the US coordinated by the American Public Health Association.

The 2006 World Health Day had the theme "Make every mother and child count."¹⁹ This theme emphasized the importance of advocating for all mothers and children around the world to make sure they have access to nutritional foods and a reduced risk for obesity.

The US Public Health Week, celebrated the first week of April in 2006, had the theme "Designing healthy communities, raising healthy kids."²⁰ This theme promoted the creation of a built environment free of obesogenic conditions. Health Educators in the U.S., Korea, China, and around the world should convey the message of healthy lifestyles and healthy environments during national and international awareness events, such as the ones mentioned above.

Health educators need to engage in research agendas related to the study of environments that promote healthy behaviors and overall wellbeing. Data is starting to be produced on obesogenic environments; however limited information is available on environments that promote health. Health educators can generate theory on the characteristics of the environment that prevents and reverses the health effects of obesity and overweight. This theory can be the basis for generation of national and international policies on obesity and overweight prevention.

It is also important that health educators become knowledgeable of public policies affecting overweight and obesity trends at the national and international levels. The role of these professionals is definitely an important one, since they serve as information resources for individuals and communities, and advocate for better conditions and quality of life. On this regard, Tarantola²¹ makes a call to public health professionals, including health educators, to advocate for public policies that promote sustainable development and enhance the capacity of states to determine the course of their health within international cooperation partnerships. Victora²² added that interdisciplinary collaboration on policy promoting sustainable development can produce substantive individual and community change towards health.

An important goal of this paper was to improve the levels of awareness of architects, urban planners, and public health practitioners on the effects of the built environment on health outcomes. Health educators and public health workers should work cooperatively with city planners and architects to create policies and urbanization patterns that prevent and reduce the rates of overweight and obesity. Health educators ought to become involved in the creation of sustainable growth policies and built environment supportive of the population's health.

This article presented a variety of interdisciplinary concerns of economic, social, and environmental nature affecting the worldwide incidence of obesity. Health educators can use this information to promote individual and collective change by advocating legislation that ensures individuals' economic capability to access nutritious foods. Health educators ought to promote social change towards the adoption of healthy lifestyles and the reduction of obesogenic environments.

They should also address the environmental factors related to obesity by educating communities on how to become proactive in obtaining a built environment conducive to health. This article presents a plea to health educators, policy makers, researchers, and grass roots organizations to support the development of sustainable communities and built environment free of obesogenic factors.

The health education profession deals with the development of individual and community educational structures conducive to health. An understanding of the relationship between obesity and the built environment is an essential element for health educators to design educational programs aimed to motivate individuals and communities towards the adoption of protective behaviors for obesity and overweight. This understanding is also necessary for health educators to act as health resources for individuals and communities on obesity and overweight prevention.

Conclusion

Worldwide coordination and planning are needed to control the obesity epidemic. Industrialized and non industrialized nations need to maintain a dialogue on global policies to prevent obesity and overweight. Korea, China, and the United States need to be active members in this dialogue. These countries need to become international advocates of sustainable growth initiatives that promote a healthy built environment.

Health educators should play an active role in advocating for healthy built environments. They need to be engaged in research and practice-oriented activities that generate data for city planners, architects, engineers, and health professionals on the characteristics of built environment conducive to the prevention and reduction of overweight and obesity.

Health educators' design of educational programs should take into account geographical and social worldwide differences. Distinctions should be made according to geographic, social, and political norms affecting obesity prevention and intervention programs. Culturally appropriate solutions ought to be designed according to worldwide statistics and needs. The involvement of communities and individuals in this process is of paramount importance. Individuals and communities at large must be active players in the prevention of obesity by participating in all phases of the health education process, beginning with the needs assessment phase and continuing with program design, implementation, and evaluation.

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