Chapter 9
A Child's Right to an Environment That Prevents Obesity: Ethical Considerations

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Introduction

The addition of children's rights to the human rights agenda was articulated and organized into specific areas by the Geneva Declaration of the Rights of the Child in 1924 at the League of Nations. It is stated that "mankind owes to the child the best that it has to give" (Parsi, 2002, p. 495). More specific principles were laid out in the Declaration of the Rights of the Child, proclaimed by the United Nations (UN) General Assembly (1959). For example, article 2 states

> The child shall enjoy *special protection*, and shall be given opportunities and facilities, by law and by other means, to enable him to develop physically, mentally, morally, spiritually and socially in a healthy and normal manner and in conditions of freedom and dignity.

The UN Convention on the Rights of the Child (1989) was put forward as the most comprehensive document to date, and helps to address children's circumstances in the modern world. It is this "special protection" that enable a child to develop physically and mentally in a healthy manner, and this paper addresses, and wishes to apply to an area not yet anticipated in 1924, 1959, or 1989.

Child and adolescent obesity has become a serious and worldwide problem that effects physical and mental development, and risks reduction of expected life expectancy (Engeland, Bjorge, Tverdal, & Sogaard, 2004). The rising prevalence of obesity in children and adults around the globe is largely (although not exclusively) thought to reflect adverse environmental circumstances, and is thus worthy of examination in a volume that addresses the rights of children to a healthy environment. A direct derivation of the rights of children regarding obesity is a relatively newer area in the child rights' discourse, and requires investigating the nature of the obesity phenomenon and the ethical issues underlying proposed preventive and therapeutic actions.

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Obesity is a primary risk condition for the *non-communicable diseases*, along with cancer, cardiovascular disease, diabetes, and hypertension, which have increased in prevalence in the developed and non-developed world (Amuna & Zotor, 2008). Just as children who face risk of the most common *communicable diseases* that have plagued children, such as pneumonia, diarrhea malaria, HIV, and neonatal infections have required, protection so too does becoming obese by reduction of risk in the areas of education, relief of the conditions of poverty, and programs to target the disease. However, non-communicable diseases differ though, in ways that engender ethical considerations.

First, non-communicable diseases are "diseases of lifestyle," so that any attempts by clinicians or policy planners require involving the "choices" of individuals as to how they live. In our case, it invokes the lifestyle of parents and caregivers in the interest of their children. Second, the morbidity and mortality of these conditions, while present in children, are mostly diseases of adulthood, while the risk is developed during the childhood years. This "silent" risk places a special burden on health promotion and prevention. How this is done and "to whom" bring up very important ethical questions, such as who is responsible for taking on this burden? Who are the appropriate shareholders? What public policies should endeavor to involve them? Finally, unlike communicable diseases, where the organization and provision of medical care (supplying immunization, medical examinations, prescription, and distribution of drugs) are necessary interventions to help reduce childhood mortality, the child obesity problem seems to require more non-medical solutions. The necessary focus on the community, groups, economic, and governmental entities requires mobilization. Children with severe health risk are appearing at health care providers' clinics in unprecedented numbers. Most available medical treatments are limited, often ineffective, unstudied, and possibly risky. Thus, Ethical challenges also arise within the confines of the examining office as to what should be done for these patients.

This article will briefly review the epidemiology of childhood obesity, thereby exploring the burden of the problem and discuss the mandate to act. The various influences upon childhood obesity will be discussed, utilizing an ecological model in which biology, and environment effect behaviors that are either "obesogenic," favoring obesity, or "leptogenic" (from the hormone leptin, which is made in adipose cells), favoring slimness. These factors that influence obesity invoke ethical challenges that include the public health agenda and the clinical care of obese child and adolescent patients. We will then apply the ethical considerations derived from the unique challenge of child obesity to the issue of child rights and discuss the "special protections" needed to combat this modern epidemic.

Epidemiology and Implications

Whether we act or not depends upon evidence of child obesity prevalence, recent trends and documentation of adverse health effects (Lobstein, Baur, & Uauy, 2004). Here I will review these areas. The biomedical definition of obesity in childhood

and adolescence is excessive fatness or adiposity to a total body weight. Body mass index (BMI; weight in kilograms divided by the height in meters squared) is generally used in children and adults to characterize body weight levels. Children's BMIs, unlike adults, are compared to a reference population of children of the same sex and age, in order to derive a percentage. Overweight is defined as above the 85th percentile and obesity is defined as over the 95th percentile.

Currently, one in three children in the United States are overweight or obese. This approaches one in two in African-American and Hispanic children. For children aged 6–19 years, the prevalence of children with a BMI>95% has risen by a factor greater than fourfold. The rise is not a recent trend, but has occurred over the past 30 years. It appears that the greatest rise in the population was between the survey periods from the 1970s to the 1990s. Not only had the rate of childhood obesity risen, but also children at the highest percentiles had higher BMIs than that observed in past years (Ogden et al., 2006). So, the amount of children who became obese rose, and the (fattest) of the children got (fatter).

Increase in the prevalence of childhood overweight and obesity is not limited to USA. The highest prevalence is in North America, Australia, and Europe (Janssen et al., 2005). Childhood obesity had also increased in some economic developing countries and urban populations (Wang & Lobstein, 2006). A more recent increase in obesity rates have occurred in the near and Middle East as well as in countries in the Asia-Pacific, Sub-Saharan region of Africa, and Central and South America. In some developing countries, overweight exceeds underweight among women (Mendez, Monteiro, & Popkin, 2005) and children (Wang, Monteiro, & Popkin, 2002).

Data suggest that childhood obesity predicts adult obesity. This prediction is the greatest for higher BMI levels and older ages. More overweight children are likely to track to adulthood than normal weight children, and more overweight adolescents than overweight children are likely too as well (Deshmukh-Taskar et al., 2006).

The health implications of this higher rate of obesity are dramatic for children and for the adults that they will become. Obesity in adults is known to be a risk factor for atherosclerosis, heart disease, stroke, non-insulin dependent diabetes, hypertension, cancer, gall bladder disease, and renal failure. Obesity in childhood and adolescence dramatically increases the risk of coronary heart diseases in adulthood. By 2035, at this rate of prevalence, it is estimated that there will be at least 100,000 excess cases of heart disease in USA (Ebbeling & Ludwig, 2008).

As the prevalence of obesity rose in children, and the severity of obesity increased, children began presenting to health care facilities with some of these adult-type diseases. The prevalence of what was formally called "adult-onset" diabetes (now type II diabetes) has increased by a factor of tenfold for children and teens (Ludwig, 2007). Obese children manifest other health problems as well, including dermatologic, orthopedic, pulmonary, and other endocrine and metabolic disease processes.

The rate of adolescent obesity, in 2002, is projected to increase the prevalence of obese 35-year-olds in 2020 to a range of 30–37% in men, and 34–44% in women (Bibbins-Domingo, Coxson, Pletcher, Lightwood, & Goldman, 2007). There are now some studies that demonstrate these projections. A group of Norwegian adolescents

were followed into adulthood (an average of 32 years) and manifested a mortality rate for those whose BMIs were above the 90% between ages 14 and 19 years, to 80% higher than those whose adolescent BMI was 25–75%. Overweight teens had an intermediate mortality rate (Engeland et al., 2004).

The ethical implications relating to the change in epidemiology arise both from doubt and a sense of urgency. Research relating to prediction of later morbidity and mortality from childhood obese states is limited. Although BMI is considered the best available screening tool for clinical practice, it is not without problems in its predictive value. It only provides an approximate correlation to the biomedical definition of obesity; it provides no specific information about cardiovascular risk, for example ratio of adipose to lean body tissue, or waist to hip ratio (Ebbeling & Ludwig, 2008). Its predictability as a risk factor is limited, as many children and adolescents might be obese, but lack other risk factors for cardiovascular disease, and are not demonstrably at risk. Should obesity be considered a risk factor, or a disease? This leads to questions such as how should the prevention and care of obesity be prioritized and funded. Issues arise regarding the analysis of the epidemiological facts, and the sense of urgency that might arise. Controversy exists as to whether the urgency that is being described is "political" in the sense that it benefits the pharmacology, health care, and weight loss industry (Campos, Saguy, Ernsberger, Oliver, & Gaesser, 2006). The mandate to "do something" can lead to either appropriate, empirically sound, and efficacious interventions or (1) diversion of scarce resources away from more pressing needs; (2) a tendency to blame, to find single parties culpable in the problem, and to attack their practices – demonizing some parties, e.g., food industry, or parents or schools; and (3) a call for the use of newer technological approaches, e.g., drugs, surgery before consideration, and development of effective prevention and less dangerous treatments that are sound and efficacious.

The terms "epidemic" and "crises" are often used in relationship to the increase in child obesity. Use of these terms reinforce and invoke urgency. Obesity rates over the last 50 years have risen significantly, and are associated the current rates of childhood diabetes and pre-diabetic states. The data suggest that the call for prompt action now is a reasonable conclusion, but it called for prompt action before now; the trend is not new. The dramatic increases in adult and childhood obesity had begun in the 1970s and 1980s. In fact, the most recent data from the NHANES surveys from 2003 to 2006 suggest that prevalence of high BMI has not significantly changed between 1999 and 2006. Perhaps the threshold of medical complications (the rise in childhood diabetes, metabolic syndrome, and liver disease) has helped the health care sector to mobilize, but along with the public health sector, it appears to be late action.

Now or before, problem or "epidemic," action is required. But, do we have the data to support prompt effective action? Or, do we act because we know we should without waiting for good data? Can we act upon the best data that we have? The complexity of the disorder, the need for preventive action above all, and the disparate populations that effect obese children lead to careful ethical evaluation of what to do, how to do it, and to whom.

The Complex Etiology of Childhood Obesity: Implications

The nature of obesity is complex, a process that includes bio-genetic, socio-cultural, and psychological aspects. The influences ultimately determine whether energy intake is greater than energy use, over the long term, which results in obesity. It is best understood as an ecological phenomenon, where many influences are bi-directional. Figure 9.1 is a summary of those factors. No single influence predominates for this multi-factorial problem. Preventive and corrective action will require multidimensional change. The environmental changes that are associated with the increase in rates of child obesity cannot solely be changed by the parties, who at this time are widely thought to be "responsible" for dealing with the problem, namely parents/caretakers and health care providers. The implication of this for public health and medical care will be further developed as we survey the domains that influence the problem.

Biological Influences on Childhood Obesity

Biological and physiological causes of obesity in children are a starting point in order to clarify what can be prevented and treated. Three primary characteristics obesity will be discussed:

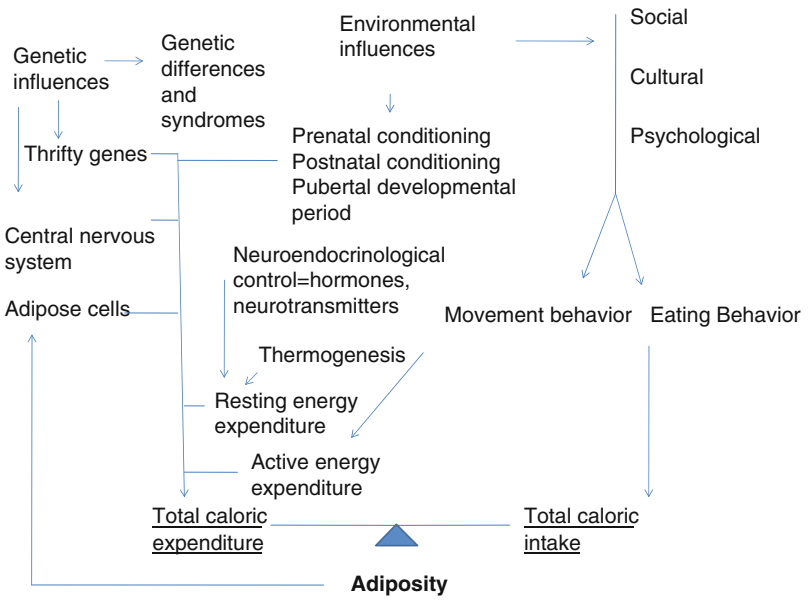

Fig. 9.1 Obesity etiology

- Etiology is multi-factorial; not correlated with single influences.
- *Thrifty genes* make obesity a common phenomenon and genetic factors affect individual levels of adiposity.
- *Body weight homeostasis* is a biological phenomenon that prevents effective treatment of obesity.

How much adipose tissue is stored in the body depends upon the dynamic balance between energy expenditure and energy intake. Expenditure and intake, both sides of the energy equation, are influenced by biogenetic phenomena, environmental and psychological factors. For infants and young children, most important influences are related to genetically determined and developmentally conditioned neuro-endocrine control of body weight regulation, as well as parent/caretaker feeding practices and expectations of the caretaker regarding physical activity needs. For older children, adolescents, and adults, all the factors affecting younger children are operative, and in addition, the elements of social effects, knowledge, and self-awareness, choice of food and activity, and psychological characteristics come into play.

Genetics plays a significant role in causing obesity in individuals. The overriding genetic influence refers to the "thrifty gene" hypothesis. Humans, having evolved from periods of their past environments where food was necessary for survival but was not always readily available, developed mechanisms where energy when available, would be more readily stored (Prentice, Rayco-Solon, & Moore, 2005). Thus, it appears that man has been selected to survive episodic famine and seasonal hungry periods, and is rather unsuited to the present period of a plethora of calories available in many areas of the world. This is termed thrifty genotype and is considered a genetic endowment of Homo-sapiens. It has also been discovered that there are individuals who have tendency to store adipose tissue above and beyond that conferred by genotype, and that the tendency has origin in the fetal period and/or the immediate post-natal period. Data support the tendency for fetuses that are growth deprived and have early catch-up growth in the first post-fetal months to develop increased adiposity and be at risk for diabetes in the child and adult years (Adair, 2008). This seems to be an acquired tendency to hold energy in response to the fetal environment, and it is through a mechanism of neuro-endocrine conditioning. Early under nutrition or over nutrition in effect "rewires" the brain, making the body tolerant of excess fat.

Genetics also plays a role in conferring unique susceptibility to obesity in individuals and their family pedigrees. Evidence of heritability is high. It is estimated that up to 40% of the variability in childhood BMI is attributable to genetic influences (Wardle, Carnell, Haworth, & Plomin, 2008). Animal models for single-gene disorders causing obesity have led to exploration of specific genes that may affect humans (Casper, Sullivan, & Tecott, 2008). Research has identified various specific genetic mechanisms for human obesity.

The rapid rise in obesity in the past decades cannot be explained by a change in the genotype of individuals beyond our tendency to store fat, and any unique genotypes in families. It does indicate an interaction between genes and environment.

Changes in availability and palatability of foods and reduction in amounts of physical exertion have resulted in an overall shift up of obesity in populations. Environmental influences override any obesity resistant genotypes at a population level.

Body weight homeostasis is an important physiological factor in the obesity problem. Multiple studies of mammals, including humans, indicate that body weight is regulated and that physiological mechanisms help to resist large changes in weight, especially downward changes (Coll, Farooqi, & O'Rahilly, 2007). Genes encode for molecular components of this regulatory system (Rosenbaum & Leibel, 1998). There are "catabolic" neuronal pathways in the brain's hypothalamus that respond to circulating signals that are secreted in response to feeding, and result in reduced food intake (through the sensation of satiety) and increased energy expenditure. The most important signals are from leptin, which is secreted in the adipose tissue; insulin from the pancreas, and cholecystokinin and peptide YY from the gastrointestinal tract. In response to dieting and weight loss, a corresponding and opposite mechanism occurs, which is "anabolic," increases appetite and lowers energy expenditure. Those signals include the hormone ghrelin and growth hormone (Popovic & Duntas, 2005). This system is inhibited in response to a plethora of available calories. It appears, from clinical, physiological, and molecular studies, that the anabolic system is far more efficient than the catabolic, and this explains the relatively easier mechanism of weight gain compared to that of weight loss. The environmental and behavioral obesogenic factors seem to create a dysregulation, or insensitivity of the catabolic side of this regulatory system. This provides the biological basis for the obesity epidemic (Schwartz et al., 2003).

It also explains the relatively poor success that most obese children and adults have with dieting to lose weight. Many can lose weight in the short term but have difficulties with sustaining the weight loss (Mann et al., 2007). Low energy intake results in the anabolic regulatory, physiologic, increased hunger, food-seeking behavior, and lower basal metabolic rate. Short-term weight loss attempts often fail – both independent and physician-guided attempts (Rossner, Hammarstrand, Hemmingsson, Neovius, & Johansson, 2008); successes depend upon long-term changes (Shick et al., 1998). Because of these physiologic effects on the human organism, prevention is more readily attainable than weight loss once obese.

The biogenetic contributions to obesity give rise to these implications: Individuals with obesity producing genotypes or regulatory adjustments due to an adverse fetal period are affected in ways that transcend what their own attitudes and actions might be able to do for obesity. Their biology is working against them and they are more likely fated to be obese compared to others. The larger cultural attitude that "it's their own fault" if they are obese is a falsehood. This is especially troublesome for children who suffer from stigma and who are bound to be obese by biological and environmental factors, both of which are not within their control, because dieting and weight loss efforts work against "thrifty genes" and neuro-endocrine regulation of body weight; therefore, prevention is better than treatment. Approaches that deal with the problem after it happens are prone to difficulty and would tend to blame the victim (and their families), if treatment is not successful. Since the older

the child, the more likely that obesity will persist, we can consider childhood a critical period; failure to prevent obesity in children seals their biological fate. Therefore, they might require prevention interventions that are morally justifiable.

Environmental Contributions to Childhood Obesity

Environmental factors have resulted in high levels of obesity in genetically susceptible children. Many factors that have changed in areas where obesity rates have risen influence the ultimate balance between energy intake and expenditure. Many cross-sectional studies and longitudinal studies have explored these influences, but the ecological nature of the problem prevents knowledge of the relative influence of each. Most theorists have suggested that these primary factors have resulted in more childhood obesity (1) food, (2) physical activity, (3) transportation patterns, (4) a change in use of time, and (5) increased media consumption. The environment dramatically influences these critical lifestyle factors.

A useful paradigm that we will utilize is described in Swinburn, Egger, and Raza (1999), where they divide important influences into the *macro-environment*, including transportation infrastructure, government policy and law, the economy (including the food economy), the media, social determinants, cultural mores, and health systems, as well as the *micro-environment*, including communities, neighborhoods, schools, peer groups, and families. Our discussion will proceed from the macro to the micro. Physical, economic, political, and socio-cultural aspects of environment are pertinent to providing an obesogenic milieu. Thus, many parties or sponsors are identifiable as contributing to the epidemic and for potential, interventions: government (federal, state, and local), industry and media, community organizations, health care organizations, charitable groups, schools, legal community, individuals, parents and families, and youth themselves.

The Obesogenic Macro-Environment and Ethical Issues

The major importance of environmental factors has been demonstrated by analyzing the changes that have occurred in areas of the world where obesity is a more recent and more rapidly developing problem. These changes have occurred: Increased availability of foods high in fat, sugar, and salt; changes in production of food and marketing in developing countries; growth of fast food outlets of large trans-national corporations; and changes in patterns of work and leisure that occur because of economic changes in the region and are sustained by media's influences on consumer choice and lifestyle. The increase in prevalence of child obesity in USA and European countries has preceded other developing countries in the world because these obesogenic macro-environmental phenomena had been in place. Specific changes in environments supporting greater intake of sweetened food and

drink, high fat food and all in larger portion sizes, more snacks, more ready-to-eat foods, and more restaurant eating provide more storable energy to the population (Anderson & Butcher, 2006). Availability of lower fat and nutritious foods has decreased in many areas. Energy expenditure has been affected by environments, which have resulted in less walking to school and elsewhere, fewer physical education classes, less play outside the home, and more use of cars, escalators, elevators, and automatic doors.

Governmental Policy

Governmental policy, whether national and local, has been recognized to influence obesity-related factors. The influences that have been discussed are (1) food production farm subsidies that favor production of corn syrup and, therefore, low cost and high sugar and high fat food availability (Schwartz & Brownell, 2007); (2) food programs under government supervision, such as the food stamp program, and school lunch programs which might influence food availability to underserved groups and children in school settings; (3) policies and standards regarding food quality and labeling; (4) educational policy (e.g., the food pyramid); (5) government and industry relationships, such as those affecting food manufacturers and advertisers, the political aspects of these relationships; and (6) state and community sponsoring awareness and preventive efforts. An issue of concern for children is the abundance of food advertising seen by children, especially on television. A 2005 review by the Institute of Medicine of the National Academies concluded that food marketing influences children's food preferences, consumption, and health (McGinnis, Gootman, & Kraak, 2006).

Various applications of law have been attempted or are being considered (Alderman, Smith, Fried, & Daynard, 2007). Evaluation of extant and proposed government policy has resulted in a vigorous dialog. Calls for public policy changes in order to remedy the problem, e.g., government regulation of food choices by taxes, regulation of food industry, and prohibiting direct advertising to children have engendered concerns about government's over-involvement in areas of personal choice and personal responsibility. "My eating habits or yours don't justify the government's involvement in the kitchen" (Kersh & Morone, 2002, p. 145). Food is linked to individual satisfaction and lifestyle, so strategies that strive to change personal food behavior often are viewed as intrusive.

Is there a government level justification to interfere with industry and personal choice in relation to child obesity? This is not a new precedent, governmental-level regulations have been applied to other areas of personal freedom, e.g., seat belts, car seats, traffic laws, and drug laws sentence checked by author and is correct. Acceptance at a societal level of such policy interventions, especially those aimed at advertising to children and regulation of school foods, depends upon whether there is real concern about obesity and whether children are considered the helpless "victims" of the obesogenic environment.

The Economy

The economy has influenced rates of childhood obesity. Personal income affects food choices and physical activity. Costs of food production, manufacturing, distribution, and retailing determine types of foods that are made available to the population. The marketing and production of food and beverages, which are preferentially desired by children and adolescents for their availability, price, and palatability, have coincided with rising obesity rates (Hawkes, 2007).

Social Determinants

The socioeconomic and demographic makeup of various sub-populations has an effect on child obesity rates. The rates of childhood obesity are higher in areas of greater poverty in developed countries and in developing countries that have a rising GNP (Monteiro, Conde, Lu, & Popkin, 2004; Ogden et al., 2006). Many mechanisms for this relationship include single parent or dual working parent families, lack of affordable healthy food, less supermarkets, more fast food restaurants, ethnically targeted food marketing, less opportunity to organize and provide healthy home environments for children, less opportunity to supervise children's activities, less neighborhood safety, and less affordable and available places for exercise (Kumanyika, 2008).

Obesity rates significantly differ by race/ethnicity. The prevalence of overweight Mexican-American male children and adolescents is significantly higher than that of overweight white children. For females, overweight rates for Mexican-American and black children and adolescents are significantly higher than white children (Ogden et al., 2006). Part of these differences relates to the effects of relative poverty as discussed above. Other parts relate to socio-cultural environmental influences in underserved communities. Traditional obesogenic cuisines, prevalent obesity norms, and body image ideals (above-average prevalence of obesity in adult female), female roles, maternal diabetes during pregnancy, parental attitudes and practices that may lead to overfeeding children, above-average levels of consumption of certain high calorie foods and beverages, under-funded schools (less fitness resources, soft-drink availability, and lower quality foods), food insecurity, higher stress levels, and increased TV time have all been hypothesized as contributing to obesity in ethnic groups in which obesity is most prevalent.

Beyond ethnic-specific cultural issues, there is an influential cultural attitude toward thinness and "fatness" that affects all groups in society. As evidenced from the advertising of the multi-billion dollar weight loss industry as well as the restaurant and food industry, we live in a "bulimic" society, where the message is eat all you want, but lose weight whenever you want, or you will not be respected. Thinness signifies control, beauty, success, attractiveness and cleanliness. In contrast, the lack of thinness represents laziness, ugliness, and is non-hygienic and not desirable. Our children and teens are continuously exposed to this "adult" cultural attitude,

and this exposure is similar to ways that we expose children to the excesses of the adult world. Children's unique physical and psychological characteristics put them in danger with are not with this overeat and diet attitude. Indeed, teens without guidance assume that the best way to lose weight is to "diet," an entity that can be defined by a myriad number of unhealthy and "quick fix" approaches, for instance self starvation and taking diet pills.

This cultural milieu creates a pervasive stigma for overweight children, who are effected from young ages of childhood. There is a relationship between a child's obesity and likelihood of being bullied (Janssen, Craig, Boyce, & Pickett, 2004). The effects of weight bias on children include effects on self-esteem, depression, body dissatisfaction, problematic peer relations, suicidal ideation and ultimately lower SES, eating disturbances, and decreased physical activity. Body dissatisfaction, lower self-esteem, embarrassment, a reluctance to engage in physical activities, and unhealthy weight loss practices (self-starving) can contribute to the overweight condition by causing mood-related eating and binging (Puhl & Latner, 2007; Puhl, Moss-Racusin, & Schwartz, 2007; Puhl, Moss-Racusin, Schwartz, & Brownell, 2008). Awareness of stigma should guide interventions. There have been mandates for mandatory BMI screening, for instance (Justus, Ryan, Rockenbach, Katterapalli, & Card-Higginson, 2007), but this would likely add to stigmatic effects upon children in a public environment (CNMC, 2008).

The ethical implications of the prevalent inequities in childhood obesity as well as cultural influences are considerable. Dietary and lifestyle characteristics are imbedded in an ecology that is influenced by macro-environmental forces of economic factors, ethnic/group membership, and cultural attitudes. Many of the changes an individual parent or care-taker might consider are beyond individual choice. Public health and clinical interventions seek to alter individual behaviors of parents and children by giving advice about eating and exercise. While it seems necessary and indeed seems the only thing that can be done, it is inequitable, because it puts the burden on individuals despite other realities. In addition, within the perception of those from minority groups, the health message might be obscured by the cultural mandate for a socially acceptable appearance. The majority culture is characterized by an undue emphasis on thinness and creates a normative discontent about body in females (Baskin, Ahluwalia, & Resnicow, 2001). Are obesity-related interventions perceived as paternalistic demands for conformity to dominant culture, or appropriate health messages? Health advice from the majority culture can be met with distrust. The overemphasis upon weight control might not be an ideally psychologically healthy aspect of majority culture. Do our methods of intervention (telling people to eat healthier foods and exercise more) feel stigmatizing for minority parents and kids?

Health Care Systems

Health care systems, including standards of health care of medical care givers are part of the macro-environment that might affect obesity. Medical systems are focused, via training, culture, and economics, upon diagnosis and treatment and are less

proficient at preventive interventions (Perrin et al., 2008). In addition, primary care physicians' practices are not optimized for chronic care and behavioral change counseling, which is not reimbursed, as well as for acute care and medical procedures. There are many underinsured segments of society, and those segments often include children who are obese or at risk. Indeed, health care reimbursement favors procedures and short-term interventions rather than the type of preventive and long-term interventions that might help prevent child obesity (Homer & Simpson, 2007; Tsai, Asch, & Wadden, 2006).

Can obesity be remedied utilizing the traditional medical interventions of short term health counseling promotion, medications and surgery? For child obesity, treatment is fraught with great difficulty. Because child obesity is associated with significant morbidities, health care professionals attempt to intervene without strong tools. The evidence base of interventions is fragmented and small scale, and there are significant questions of efficacy and sustainability in most health care settings. Indeed, the most effective interventions that have been researched have occurred in multi-disciplinary settings, largely unavailable to most children and parents (Hughes et al., 2008; Spear et al., 2007). Recent expert recommendation for treatment calls for types of interventions unavailable to most practitioners (Spear et al.). Care that is necessary for the rising numbers of obese children must be sustained and multi-disciplined. Prevention and treatment need reimbursement on par with other health care services. Our health care system currently does not make this available to providers and families.

The clinician when caring for an obese child, aware of the health risks, is compelled to intervene utilizing the resources available. Since obesity is a very difficult problem to treat and success rates are low, the age old medical ethics principle of *first, no harm* becomes prominent. Obese children and adolescent care requires frequent monitoring, adherence to medical "prescriptions" for food and exercise, ones that are difficult for care givers and patients to follow. This results in concerns among pediatricians of non-adherence, and sets up a potentially contentious relationship, especially for the most severely obese children. Indeed, investigations of child abuse and neglect have been called for in cases of extreme obesity (BBC News, 2007). Those children are also at higher risk in the medical system to be exposed to drugs and surgery, both methods lacking a well established record of effectiveness and safety (Inge et al., 2004).

The Community Environment

The community environment includes the local area infrastructure, the commercial environment, and the school environment. Analysis of studies attempting to clarify the relative contributions of these factors has been equivocal, perhaps due to methodological problems (Holsten, 2008). Availability of fast foods effects overweight in adolescents' more than younger children (Rosenheck, 2008). The school environment has been questioned as an obesogenic influence because of

decreasing time for physical education, unhealthy foods available in vending machines, and school-supported marketing of foods with low nutritional value (Molnar, Garcia, Boninger, & Merrill, 2008; Story, Kaphingst, & French, 2006). There are a lack of interventions reported, targeting specific childhood racial and ethnic subgroups. Researches on community interventions that are ethnically and racially specific and that have been efficacious are needed for community public health planners to utilize evidence-based approaches (Economos & Irish-Hauser, 2007).

Macro-environmental changes, due to the ecological complexity, require critical appraisal of preventive interventions as well as contribution of sponsor's involvement at many levels of society. The public has demonstrated concern over the problem of child obesity (Evans, Finkelstein, Kamerow, & Renaud, 2005). However, the multi-factorial contributions to the problem would require concern at many levels of private and public sponsorship in order to create favorable change or the macro-environment. A useful demonstration paradigm has occurred in Western Europe, in which sponsors were contacted to determine changes that would be acceptable and useful (Millstone & Lobstein, 2007). The needs of children might challenge philosophical and legal concepts of commercial freedom and government support of free commerce. For example, the Sydney Principles' for reducing the commercial promotion of foods and beverages to children, adopted by the International Obesity Task Force (Swinburn et al., 2008), suggest that children's rights call for marketing restrictions. Advocacy for projects that deal with multiple sponsors is needed to support upstream change (Dietz, Bland, Gortmaker, Molloy, & Schmid, 2002).

The Obesogenic Micro-Environment and Ethical Issues

The micro-environment includes where adults and children live their lives within their homes and in their schools and communities. The overriding influences on child obesity in this sector, the structure and needs of the family, as well as parenting attitudes and practices, attitudes and behaviors of other influential adults (extended family, school, and community), and peer attitudes and behaviors.

Research has supported the effect of parenting on childhood obesity. Breast feeding has shown to be protective (Arenz, Ruckerl, Koletzko, & von Kries, 2004; von Kries, Koletzko, Sauerwald, & von Mutius, 2000). Parenting practices, such as exerting pressure and restriction of foods has contributed to subsequent obesogenic eating styles in children (Faith & Kerns, 2005). Overly permissive styles can also contribute to unhealthy eating, lack of exercise, and television watching, and lack of sleep (Knutson & Van Cauter, 2008). In addition, the risk of obesity is increased by physical abuse, verbal abuse, humiliation, neglect, strict upbringing, physical punishment, and conflict or tension (Ventura & Birch, 2008).

Parental knowledge and attitudes also are pertinent (Crawford, Timperio, Telford, & Salmon, 2006). In many minority parents, attitudes and behaviors may

be supportive of higher level of obesity compared to than in non-minority parents. Many parents underestimate their child's level of overweight. Studies have shown that shown that Latina mothers, and those with low income and lower levels of education do not view their preschool children as overweight (Hackie & Bowles, 2007; He & Evans, 2007; Jain et al., 2001). Some positive attitudes about overweight might persist in those who come from backgrounds where thinness is related to illness, poverty or drug addiction (Kumanyika & Grier, 2006).

Gender considerations affect child obesity as well. Women are mostly responsible for organizing, preparing and providing food to children (Warin, Turner, Moore, & Davies, 2008). Gender and class-based aspects of mothering are not often explored or understood in the area of health promotion. Experiences of women from different social classes, and their understanding of their role as mothers might differ from counseling requests for individual behavioral change.

Family environmental issues provide complex fields of influence embedded in a multi-layered environment, which include tastes, traditions, convenience requirements/choices, foods available at home, food/meal routines, feeding styles, family members' weight status and diet, attitudes toward overweight individuals' weight status, encouragement of physical activity, and rules regarding TV use.

Culpability and responsibility are primary ethical issues in child obesity. Dietary and lifestyle occur within an ecological context including macro and micro-environmental factors. The act of directing behavior (giving advice) either in clinical settings or via public forum that is incongruous with forces beyond individual choice is ethically troublesome. There is a presumption of parental liberty in our attitudes and law, resulting in relative freedom from intrusions of state, and yet many children are becoming obese. Is "letting" a child become obese a dereliction of parental responsibility? Should there be individualized interventions based upon BMI screening in order to protect certain children? Are the risks to children less important than the rights to privacy or commercial freedom?

Environments, Ethics and Children's Rights

We have derived these ethical questions from our discussion of the nature of child obesity. They are summarized as follows:

- Does protection of children require coerced action and a paternalistic approach at a public health and clinical level, or can efficacious educational and preventive interventions be developed?
- Whose culpability/responsibility is childhood obesity in view of complex, multi-level influences? Does culpability mandate responsibility for ameliorating interventions?
- What action is mandated when results of action are not clear? What are the priorities for action?
- Uneven social determinants exist in childhood; can interventions be socially, ethnically, and racially appropriate (efficacious and respectful)?

- There are definite stigmatic aspects of being an obese child; can we steer clear of inadvertent harm to children and families in our interventions by providing developmentally appropriate interventions; identification of child/teen patients that does not add to stigma and, prevention of eating disordered behavior?

The ecological influences on child obesity that have been discussed create a challenge to help children prevent and reduce obesity. Analyzing the problem of child obesity as a "rights" issue, in addition to a public health challenge may add moral authority to public consideration of changes that are needed (Greenway, 2008). Supporting and promoting their rights require considerations that are child specific and can help guide preventive and therapeutic interventions, both at a public health, and a clinical level:

1. Children need special protection in this obesogenic world environment. They are an at-risk population whose "biological fate" is dependent on macro- and micro-environmental influences. Children's health has been harmed by changes in the environment. Therefore, child and adolescent health must become a more active consideration in factors such as building communities for healthier movement, altering community food environments; regulating food advertising; and developing government sponsored nutrition, educational, and health programs. Precedent for regulations and policies that protect the public health already exists for other health risks, e.g., motor vehicle injury, alcohol, and tobacco, and are justifiable to protect children.
2. Public health interventions will be most effective if they address *upstream* effects on children's health, looking at the macro-environmental level and the community level, rather than focusing upon individual family behavior.
3. Public health and *prevention* model *is better than treatment* model. This derives from the nature of the obese state.
4. *Despite the need for action, interventions should be evidenced-based and strive to do no harm*. Some approaches and treatments do have the potential to harm, rather than help, especially if fragmented from socio-cultural considerations or derived from untested methods.
5. *Interventions need to be developmentally appropriate*. Psychosocial and developmental uniqueness of children and adolescents, requires a measured approach different than the approaches utilized for adult weight loss. Health, rather than weight, should the be goal of prevention and treatment. A weight focus, by itself, is likely to result in child, parent, and health provider frustration and despair, contributing to stigma, and blaming children and parents.
6. *Intensive medical interventions should only involve severe obesity with severe obesity-related complications*. In view of our knowledge of health risk and treatment risk, we are not justified in providing treatments that might harm rather than help.
7. All interventions must *address stigma and social attitudes*.
8. Socio-cultural mediators require research and analysis of subcultures and subpopulations so that interventions are grounded in cultural traditions and norms unique to groups at risk.
9. Environmental change that helps prevent and reduce child obesity requires *sponsors working together* to ensure effective change and to avoid unintended consequences.

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