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The Causes of Obesity

The prevalence of overweight and obese adults in the United States (US) has steadily increased

examine what the extant literature in various disciplines tells us about what causes obesity and is causing an increase in obesity.

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- Osteoarthritis,
- Gallstones,
- Dyslipidemia,
- Musculoskeletal issues, and
- Psychological and Psychosocial issues.⁹

The health consequences of obesity are quite serious and costly. In an effort to curb the associated health risks, understanding more about the factors that contribute to the cause of

Diet

A growing issue related to obesity is an individual's diet. For the past 50 years, there has been an increasing amount of effort put into the health and wellbeing of an individual with little focus on teaching good nutritional practices.¹³ Areas that need to be looked into more thoroughly are fats, portion sizes, and sugars.

Because studying humans in a controlled environment for a long-term experiment is impossible, some researchers have chosen to study rodents to model the human metabolism and learn more about how a high fat diet may lead to weight gain, although what exactly constitutes a high fat diet hasn't been clearly defined. One study that used rats to model the human metabolism determined that diets with a fat content of more than "40% energy based on animal fats and fats from the unsaturated fat family *w-6* and *w-9* fatty acid – containing plant oils will lead to obesity, whereas diets with larger amounts of marine *w-3* another unsaturated fat will not."¹⁴ "High-fat diet promotes excessive energy intake by passive overconsumption; fat-induced appetite control signals are too weak or too delayed to prevent excessive energy intake from a fatty meal."¹⁵ This problem is related to the issue of how much food one eats during a sitting.

restaurants,

Unlike sugar-sweetened foods, sugar-sweetened beverages do not seem to provide adequate satiety. Satiety, a feeling of being full, leads a person to stop eating after ingesting sufficient food. Lack of satiety prevents individuals from compensating for the calories ingested from SSBs during later meals.²⁹ This dynamic leads to a higher total caloric intake overall, by an average of 172 calories in children and 175 calories in adults each day among those who drink SSBs.³⁰ Over time, this can lead to significant weight gain. According to a study conducted during 1995 to 1997 on schoolchildren, the risk of obesity increased one to six times with each additional daily serving of sugar-sweetened beverage.³¹

It is also believed that the routine consumption of sugar-sweetened beverages may lead consumers to develop a preference for sweeter, less satiating foods over healthier options. There is a considerable amount of evidence that supports the claim that sugar sweetened beverages can cause obesity.

According to Kelly D. Brownell et al., there *is* a causal link between the consumption of sugar-sweetened beverages and the risk for obesity, diabetes, and heart disease because there is a positive association between SSBs and weight gain.³² Brownell declares that behavioral and biological mechanisms are responsible for the connection between the consumption of sugar-sweetened beverages and these health problems. For example, adverse physiological and metabolic effects of sugar include the elevation of triglyceride levels and blood pressure and the lowering of high-density lipoprotein cholesterol levels ("good" cholesterol), which could increase the risk of coronary heart disease.³³ He also points to weight gain as a consequence of "poor satiating properties of sugar in liquid form," in which many people do not adjust their calorie intake in accordance with the amount of calories in SSBs.³⁴ Additionally there are psychological effects that Brownell and his colleagues explored. For instance, many people consume sugar-sweetened beverages in absence of hunger in order to satisfy thirst or for social reasons, while children who habitually consume these beverages come to find them more

approach may be discredited by the rapid increase in the prevalence of overweight and obesity. Greater focus of attention on physical activity would be beneficial.⁴⁵

Physical activity has been a practice used in school systems to get into the habit of exercising. Recess is a regular event occurring in elementary schools that allows children to discover enjoyable physical activities and increase their motivation to engage in more movement, thereby forming habitual physical activity patterns that potentially reduce obesity.⁴⁶ Adequate use of recess time will lead to more physically active children meeting the goals of the Surgeon General's advisement of 30 to 60 minutes of physical activity on most if not all days of the week. For instance, if a child gets the recommended amount of physical activity, research findings suggest that physical activity can positively influence mood states, mental health, anxiety reduction, and brain function.⁴⁷

According to a survey done by the 2000 National College Health Assessment, 57% of male and 61% of female college students reported that they had completed no physical activity on at least three of the previous seven days.⁴⁸

South. In the Northeast, however, rural adults were less likely than their urban counterparts to be physically inactive by over 10%.⁵⁰

One study looked into the potential reasons why area of residence is a factor for obesity. It found that there is no difference between the total cholesterol, blood pressure, smoking, and physical activity levels of rural and urban children. However, there was a significant increase in the BMI and sum of skin folds of rural children, resulting in a 54.7% increased risk of obesity in rural children over urban ones.⁵¹ Suburban residents were more likely to meet physical activity recommendations than their urban or rural counterparts.⁵²

Additional studies of the effect one's neighborhood has on obesity have indicated that obesity has been linked with living close to highways, living on streets without sidewalks, having no perceivable paths within walking distance, having poor access to recreational facilities, having no shopping areas within walking distance, and not having constant access to a vehicle.⁵³

Additional Factors

There are several additional factors that may contribute to obesity and include various forms of pollution, sleep, medicine, and depression. All are discussed in the following section.

Pollution

Endocrine disruptors, which manipulate the hormones that control body weight, are thought to be a potential cause of obesity.⁵⁴ These disruptors have numerous common sources such as pharmaceuticals, plastics, food, and toys.⁵⁵ Additionally, chemical pollutants such as

⁵⁰ Patterson, P.D., C.G. Moore, J.C. Probst, and J.A. Shinogle. "Obesity and Physical Inactivity in Rural America." *The Journal of Rural Health* 20 (2006): 151-159 <http://www.ncbi.nlm.nih.gov/pubmed/15085629> (accessed August 23, 2010).

⁵¹ Dietz, William H. Jr., and Steven L. Gortmaker. "Factors within the physical environment associated with childhood obesity." *The American Journal of Clinical Nutrition*. 39 (1984): 619-624.

⁵² Parks, S.E., Housemann, R.A., and Brownson, R.C. "Differential correlates of physical activity in urban and rural adults of various socioeconomic backgrounds in the United States." *Journal of Epidemiology and Community Health* 57 (2003): 29-35

benzo[a]pyrene have been shown to induce obesity.⁵⁶ Carcinogens that focus on adipose (fat) tissue, such as organochlorine pesticides and polychlorinated biphenyls (PCBs) may also have an effect on weight.⁵⁷

Sleep

Research indicates a link between obesity and lack of sleep. The National Health and Nutrition Examination Survey I (NHANES) of more than 9,000 participants in 1982-1984 determined that those getting less than seven hours of sleep at night were more likely to become obese.⁵⁸ Less sleep typically means greater exposure to light thereby throwing off one's natural internal mechanisms like their metabolism. Additionally, it's possible that when one is awake longer they may ingest more food. Numerous studies have indicated a clear relationship between lack of sleep and obesity. It has also been shown that lack of sleep may make it more difficult to lose fat. A preliminary study conducted in 2009 compared two groups of people on a nutritionally balanced, calorie-reduced diet with one group getting at least seven hours of sleep and the other getting approximately five hours of sleep. Those on the sleep restricted plan lost only 26% of fat but those following the normal sleep plan lost 56% of fat indicating that sleep plays a considerable role in fat reduction.⁵⁹

Studies have made it clear that lack of sleep is linked to obesity in a variety of ways including metabolic disturba

and obesity is poorly understood but the two *are* linked.⁶² Sarah Mustillo, Ph.D. notes that the link could have to do with social or neuroendocrine-related factors. She argues:

At the center of the obesity-depression link is biology in which the route of communication between the hypothalamus, the part of the brain that governs parts of the nervous system, and the pituitary and adrenal glands, which secrete a variety of hormones, work together to maintain chemical equilibrium when the body is under stress. This hoiiri 138(r)38(i 138(r)-1(o)11)34(i)3 reW n7i

availability of food may be an important mediating factor in the relationship between

susceptible to obesity.⁷⁹ Additionally, commercial physical activity-related facilities are less likely to be found in lower-income neighborhoods and in neighborhoods with a greater minority population.⁸⁰ The availability of fitness-related facilities is directly related to income level, meaning that financially disadvantaged households have less of an opportunity to go to such facilities. Rural areas are also less likely to house such businesses than urban ones.⁸¹

This section has demonstrated that there are many socioeconomic factors that contribute to the presence of obesity. Another important topic, especially when considering how to address the obesity problem, is the association between dieting, eating disorders, and obesity. This is discussed in the following section.

Eating Disorders

There is a linkage between dieting, eating disorders, and obesity.⁸² While dieting is often conceived as a solution to the rising obesity epidemic, a number of studies suggest that dieting is not effective in preventing weight gain, and in some cases, dieting may actually be associated with an increased risk of obesity among children and adolescents.⁸³ Dieting may promote weight loss but restrictive eating may provoke disordered eating which may then lead to obesity.⁸⁴ There are two types of eating disorders known to contribute to obesity: binge eating disorder (BED) and night eating syndrome (NES). BED is the most common eating disorder, affecting three percent of adults in the US, and is most common among severely obese people.⁸⁵ Those with BED tend to engage in frequent dieting behaviors⁸⁶ and it has been

⁷⁹ Powell, Lisa M., Sandy Slater, Frank J. Chaloupka, and Deborah Harper. "Availability of Physical Activity—Related Facilities and Neighborhood Demographic and Socioeconomic Characteristics: National Study." *American Journal of Public Health* 96 (2006): 1676-1680 <http://ajph.aphapublications.org/cgi/content/abstract/96/9/1676> (accessed June 30, 2010).

⁸⁰ Powell, Slater, Chaloupka, and Harper. "Availability of Physical Activity—Related Facilities and Neighborhood Demographic and Socioeconomic Characteristics: National Study."

⁸¹ Powell, Slater, Chaloupka, and Harper. "Availability of Physical Activity-Related Facilities and Neighborhood Demographic and Socioeconomic Characteristics: A National Study."

⁸² Haines et al. "Prevention of Obesity and Eating Disorders: A Consideration of 9 Shared Risk Factors."

⁸³ Haines, Jess and Dianne Neumark-Sztainer. "Prevention of Obesity and Eating Disorders: A Consideration of 9 Shared Risk Factors." *Health Education Research* 21 (2006): 770-782. <http://her.oxfordjournals.org/cgi/content/full/21/6/770> (accessed June 23, 2010).

⁸⁴ Carrier, K. M., Steinhardt, M.A., and Bowman S. "Rethinking traditional weight management programs: A 3

suggested that dieting is a precursor for binge eating disorder.⁸⁷ Adolescent girls that diet have three times the chance of becoming obese than those that do not diet. This is because of the cyclical pattern of restrictive eating followed by overeating or binge eating.⁸⁸

Night eating syndrome is more common in obese people than non-obese people. It affects about 33% of morbidly obese persons (those who are 100 pounds or more overweight) and its prevalence increases with weight.⁸⁹ Studies indicate that those with NES often suffer from a type of depression that increases as the day progresses.⁹⁰ Therefore, there is additional evidence that supports a link between depression and obesity.⁹¹

Food Advertising

According to a recent study published in the *American Journal of Public Health*, childhood obesity is directly related to children's exposure to television commercials that advertise unhealthy foods.⁹² Researchers gathered data from primary care providers of over 3,000 children ranging from infants to 12 year olds regarding their television viewing habits and the format of TV entertainment, such as DVDs, cable television, etc., over the course of five years.⁹³ They found that commercial viewing (e.g. viewing non-educational programs containing commercials) was positively associated with higher BMI, while non-commercial viewing (like DVDs or educational television programming) had no significant association with obesity.⁹⁴ The

⁸⁶ Spitzer, R.L., Devlin, M., Walsh, B.T., Hasin, D., Wing, R., Marcus, M., Stunkard, A. J., Wadden, T., Yanovski, S.,

study suggests that turning kids away from commercial television could help in reducing childhood obesity.⁹⁵

Kids aged 8 to 18 spend approximately four hours per day watching television and an additional two hours on the computer. Not only does watching TV and working on the computer affect a child's physical and mental development⁹⁶ but it is a major form of sedentary behavior.⁹⁷ CDCP confirms the association between television watching and overweight and states that television viewing increases children's food consumption through snacking and eating meals.⁹⁸ Television viewing lowers their metabolic rate because of a decreased ability to burn fat while watching TV.⁹⁹

On average, children in the US watch about 10,000 food advertisements each year and almost all of them are marketing sugar cereals, fast foods, candy, or soft drinks.¹⁰⁰ For children's television programming, half of

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