Volume 20 Issue 38
Originally issued as K7



Global Journal of Medical Research: K
Interdisciplinary
Volume 20 Issue 7 Version 1.0 Year 2020
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals
Online ISSN: 2249-4618 & Print ISSN: 0975-5888

The Social and Cultural Factors Affecting Obesity Rates in America

By Meghan Harduk

Introduction- Obesity is a national epidemic in the United States (4). Obesity is determined by BMI, dividing height (kg) by weight (m^2). These measures are taken to determine weight status which can either be Underweight (<18.5 kg/m^2), Normal Weight (18.5-24.9 kg/m^2), Overweight (25.0-29.9 kg/m^2) or Obese (30.0 and above kg/m^2). Starting around the 1970s and 80s, we start to see an increase in obesity rates within the United States, as shown in Figure 1. Through the use of NHANES and other national surveys, we see not only increases in obesity but also extreme obesity. Adult obesity was only 13.4%, and child obesity was 5% in 1980. (53, 55).

Today, adult obesity has risen to an alarming 39.6%, and childhood obesity has risen to 18.5%. These figures are1 in every three adults, and 1 in every six children (4, 72). We can see that the South has the highest obesity rates at 33.6%, as displayed in Figure 2. There are disparities in obesity rates depending on your age, gender, race, education, socioeconomic status, and the built environment one lives within. Blacks (46.8%) and Latinos (47.0%) have higher obesity rates than Whites (37.9%) and Asians (12.7%). These numbers are consistently disproportionate across both adults and children (3, 23, 72).

GJMR-K Classification: NLMC Code: WA 360



Strictly as per the compliance and regulations of:



© 2020. Meghan Harduk. This is a research/review paper, distributed under the terms of the Creative Commons Attribution-Noncommercial 3.0 Unported License http://creativecommons.org/licenses/by-nc/3.0/), permitting all non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

The Social and Cultural Factors Affecting Obesity Rates in America

Meghan Harduk

I. Introduction

Obesity is a national epidemic in the United States (4). Obesity is determined by BMI, dividing height (kg) by weight (m^2). These measures are taken to determine weight status which can either be Underweight (<18.5 kg/m^2), Normal Weight (18.5-24.9 kg/m^2), Overweight (25.0-29.9 kg/m^2) or Obese (30.0 and above kg/m^2). Starting around the 1970s and 80s, we start to see an increase in obesity rates within the United States, as shown in Figure 1. Through the use of NHANES and other national surveys, we see not only increases in obesity but also extreme obesity. Adult obesity was only 13.4%, and child obesity was 5% in 1980. (53, 55).

Today, adult obesity has risen to an alarming 39.6%, and childhood obesity has risen to 18.5%. These figures are1 in every three adults, and 1 in every six children (4, 72). We can see that the South has the highest obesity rates at 33.6%, as displayed in Figure 2. There are disparities in obesity rates depending on your age, gender, race, education, socioeconomic status, and the built environment one lives within. Blacks (46.8%) and Latinos (47.0%) have higher obesity rates than Whites (37.9%) and Asians (12.7%). These numbers are consistently disproportionate across both adults and children (3, 23, 72). Adult women are more like to be obese at 41.1% in comparison to adult males at 37.9% (23). Adults with a college degree are less likely to be obese than those with only a high school diploma (22.2% vs. 33.1%), and both are less obese than those who do not have a high school diploma (35.0%) (2, 3, 23). Tied to education are socioeconomic status and financial income. Individuals with a higher income are less likely to be obese in all of the groups mentioned above at about 29.7% (2, 3, 23). The physical environment of where individuals live also can impact their obesity rates. Those living in more rural areas are more likely to be obese compared to those in metropolitan areas, 34.2%, and 28.7%, respectively (23, 72). The age of an individual also says a lot about obesity prevalence. Middle aged to older adults are more obese (42.8% and 41.0%) when compared to young adults (35.7%) (2, 3). Moreover, one of the most striking statistics is that of childhood obesity. Childhood obesity has increased drastically over the years at alarming rates among all groups and all income levels all over the world. The US is estimated to have some of the highest obesity and overweight levels in the world, seeing an increase last year to 18.4% of overweight children ages 5-19 years old (36). Of children ages 2-19 years in the US, 16.9% qualified as obese (4, 54).

These numbers are especially troubling because of associations with negative health outcomes. Individuals suffering from obesity are at higher risks of several other diseases. This includes: diabetes, cardiovascular disease, hypertension, strokes, certain cancers, mental illness, and many more (1, 4, 36). Thus, it is critical to gain a better understanding of the causes of obesity, including those derived from socio-cultural circumstances such as class, race, gender, region, or age.

African Americans ages 18-49 years are twice as likely to die from heart disease or stroke in comparison to their white peers. African American men and women are more than 40% more likely to suffer from high blood pressure and 80% more likely to be diagnosed with diabetes, both of which are risk factors for other health problems (51, 52). Asian Americans suffer at lower rates of obesity (12.7%) but still suffer from obesity-related diseases. Asian Americans are 10% more likely to be diagnosed with diabetes in comparison to whites. Roughly 20% of Asian Americans have high blood pressure with 6% having coronary heart disease (39, 45, 46). Hispanics are at higher rates of obesity (47.0%) compared to their white peers. Hispanic adults are diagnosed with diabetes 12.2% of the time compared to their white peers at 7.3%, which is almost 2x as high (47, 48, 49, 50).

So why do we see such disparities in obesity rates from the past to now and between groups? Several reasons have contributed to the rising obesity rates over the past few decades. Let's first take a look at food and how it has changed over the past few years. Compared to the 1970s, Americans consume more food away from home at restaurants and fast food establishments. When food is consumed at home, less time is spent on cooking. Americans spend more money on fast food now compared to the 1970s (32). Foods prepared away from home are higher in calories, saturated fats, sodium, cholesterol, and carbonated soft drinks. Inversely, they contain fewer vitamins, minerals, fiber, fruits, vegetables, and milk. A few studies also found that more calories came from additional snacking (e.g., salty snacks, cheeseburgers, pizza) throughout

Author: *e-mail: mlharduk@uncg.edu*

© 2020 Global Journals

the day, especially in adolescents (22, 41, 42, 57, 65, 67).

Consuming larger portions of food signifies an increase in total calories consumed. Individually or combined with a decrease in energy expenditure (i.e., physical activity and exercise), individuals gain more fat mass and can become overweight and obese (40, 61, 62, 76). We've collectively agreed that portion sizes over the years have increased. Now we have to empirically prove that sizes have indeed changed. Many researchers have been interested in this question and decided to empirically prove (or disprove) the commonly accepted belief about portion sizes. Portion size information was obtained from companies from the past and the present. Having the size difference information, the studies were able to analyze factors of change like total calorie intake, sodium, cholesterol, vitamins, minerals, carbonated beverages, etc. The research indicates increased consumption of "bad" foods and decreased consumption of "healthy" foods. Since the 1970s, individuals are eating higher amounts of sodium, cholesterol, saturated fats, etc., and fewer amounts of fresh fruits, vegetables, etc. Alongside this change in the type of food consumed, these studies found that portion sizes have increased over time, some even being 2-3x as big as the original food product. This size increase has been noted inside and outside the home. It is not just a problem when dining in a restaurant, it is a societal issue (40, 61, 65, 66, 76). However, obesity is not a uni-causal issue. The multi-level complexity of obesity encompasses both the change in the type of food consumed as well as the portion size of foods consumed, but they are only pieces of a much bigger puzzle.

Another piece of this puzzle is sedentarism. Sedentary behavior is characterized as an individual spending excess time in low energy expenditure activities like sitting or lying down and very little time in moderate to vigorous energy expenditure activities (20, 26). Sedentary behavior and physical activity and exercise are inversely related. As sedentarism increases, physical activity and exercise decrease. There has been major concern in the scientific community as well as the public regarding overweight and obese individuals. As America has seen a great increase in overweight and obese individuals, we have also seen rises in other related health conditions such as cardiovascular disease and diabetes. Both sedentarism and a lack of physical activity and exercise have been linked to obesity and other related diseases (25, 26, 34, 56).

Several factors contribute to sedentary behavior, including jobs and technology. Back in the 1960s and 1970s, America was a massive agricultural society. Farming is a laborious job that requires a lot of moderate-to-vigorous physical activity. Since that time, we have seen an occupational shift to desk jobs, i.e., sedentary jobs (15). The American Heart Association estimates sedentary jobs have increased by 83% since 1950 (16, 71). A decrease in the amounts of moderate-to-vigorous physical activity follows the rise of sedentary jobs. One study estimated that there has been an average decrease of 100 calories per day in job-related energy expenditure compared to 50 years ago (11). Approximately 13.7% of jobs require "heavy work," according to the U.S. Bureau of Labor Statistics (8). The 13.7% of heavy work jobs here were related to construction and other related forms of manual labor. At the same time, approximately 13.5% of jobs are sedentary, with the most prevalent being legal and administrative positions. This occupational shift has contributed to the rising levels of sedentary behaviors and, consequently, obesity.

In addition to occupational shifts, we have also seen an increase in technology. The television (TV) had been invented back in the late 1920s by Philo Farnsworth. Still, it didn't gain popularity until the 1950s, after World War I. TV had become one of the most popular forms of entertainment and user consumption grew drastically. This rise led to approximately 12 million homes having a TV by 1951 (70, 78). Today, leisure activities include watching tv, browsing on other screens (computers, phones, tablets, etc.), or playing video games. Not only do we see increases in sedentary leisure-time behaviors, but we see a decrease in physical activity leisure time (11, 15). A study of 6,329 participants found that people spend more than half their time (54.9%) in sedentary behaviors – that is approximately 7.7 hours per day (in an averaged 13.9-hour day) (35, 71). In addition to TV and phones, we also see a rise in technological progress regarding transportation, namely automobiles (aka cars). Cars became popular in the early 1900s through historical figure Henry Ford. As popularity increased, the need for roadways and interstates grew. In 1956, President Eisenhower signed the Interstate Highway Act, creating thousands of miles of highway across the country (18). This increase in car mobility has added to the rising rates of sedentarism.

An increase in sedentarism has contributed to the rising obesity rates, but inversely we see a decrease in physical activity as another contributor to rising obesity rates. These rising inactivity levels are associated with higher risks for obesity and other health-related diseases (20, 25, 26, 34, 56). The U.S. Department of Health and Human Services has issued a *Physical Activity Guidelines* booklet, highlighting the recommended minimum physical activity requirements to stay healthy. For adults, this includes 150 minutes-300 minutes of moderate-intensity or 75 minutes of vigorous-intensity aerobic exercises plus 2+ days of muscle-strengthening activities - involving all the major muscle groups -each week (74). Less than 25% of Americans are meeting both aerobic and muscle-strengthening guidelines (Figure 3). Approximately 28%

© 2020 Global Journals

of Americans meet muscle-strengthening guidelines alone, and 37.4% meet aerobic guidelines alone (10, 74).Again, we see disparities in one's physical environment (Colorado is the most physically active), age (55+ are less active than younger adults), race (Hispanics are the least active), gender (males are more active), education (college graduates are the most active), and socioeconomic status (lower incomes are less active).

With this overall decline in physical activity, we also take note of the decline in sport participation, especially in adolescents. The Aspen Institute and the Sports & Fitness Industry Association (SFIA) partner together to gather data on youth participation through Project Play, which focuses on kids ages 6-12. The data shows the overall percentage of kids who played a team sport regularly has decreased from 41.5% in 2011 to 37.0% in 2017 (28, 31). Interestingly enough, the percent of team sports has increased (from 55.5% to 56.5%) while the percent of individual sports has decreased (73.0% to 69.1%). There is a difference in male vs. female participation rates, although the percentage of female participants has increased from 49.4% to 52.3% (compared to males from 61.3% to 61.9%). Income status also affected youth sport participation. In general, lower-income status children participate less in sport. One study looked at the commitment to sports and observed tennis players and their club memberships. They found that skill level was a major factor in the level of commitment an individual had in playing the sport (9). Another study done in the South Caucasus proposed that family culture was a major source of influence on sport participation before the age of 16 (6).

It is proposed that while all the issues above contribute to obesity rates, they are all connected to and influenced by one's social class. An individual's social class, referred to as one's socioeconomic status, is often measured by their income, education, and occupation (68). These factors heavily impact the decisions to be made by individuals regarding their diet and activity. Many studies have found that social class does impact rates of obesity, with higher rates in girls than boys (19, 30, 38). For example, an individual on a strict budget won't have time or money to spend on gym memberships, groceries, or houses/apartments near playgrounds or walkways. If an individual cannot afford to be near physical activity promoting infrastructure, will they be encouraged to be physically active?

Obesity, physical inactivity, sedentarism, unhealthy diets – it is obvious we have a problem. With these rising rates of unhealthy behaviors, we see negative health consequences arising that are affecting the livelihood and well-being of Americans. What are we supposed to do then? The obesity epidemic and all the health issues that follow it are rising and harming people's lives. How do we propose to stop it? There are two aspects of this we need to address: societal changes and personal changes. As individuals, we are responsible for the decisions that we make. We are capable of choosing healthier options that can improve the odds of health problems. We also see the need for society to change, given we have certain structures and institutions in play that feed the obesity epidemic. It is therefore imperative that medical and health professionals address both sides of this issue, including both physical activity and diet behaviors, on a personal and societal level (27).

First, let's look at some personal decision's individuals can make to improve their health and decrease their risks of obesity and other health problems. Simply put, Americans need to become more physically active. While this does include exercise, it more broadly includes physical activity, which is activity throughout a day. This is compared to small, high energy bursts of exercise at the end of an 8-hour workday, having sat at a desk, staring at a computer screen. As we've seen before, sitting too much is dangerous for our health, yet we do it far too often. Changing our sitting habits is a necessity (7, 21). Leaving your desk to move around more often on breaks is suggested to disrupt the amount of time we spend sitting (especially those with desk jobs). We can also make small decisions like taking the stairs, walking farther in a parking lot, or biking or walking to places instead of driving. These are small, simple changes that could drastically change how physically active we are. There is evidence to suggest that holding membership in a club sport also increases your overall physical activity (77). Holding the membership is good, but the relationships formed in that group are vital to the continuation of an individual playing that sport. Whether friends or family are encouraging group membership, our relationships influence our motivations and desires to engage in physical activity (73). Physical activity not only helps with the obesity crisis but can encourage positive psychological and social health (13).

While there are many personal decisions an individual can make to become more active, there are also societal changes that can improve rates of activity when implemented. One of the most popular issues here is recess. Over the past few years, we have seen a decrease in time allotted for recess, a time for children to have unstructured playtime to "burn off" their energy after sitting in a classroom all day. Several laws (e.g., No Child Left Behind Law, Every Student Succeeds Act) passed within the past 20 years have taken a focus more on education than on physical activity. This focus towards course curriculum has forced educators to decrease the amounts of time in physical activity to prepare their students for upcoming mandatory testing despite research informing us of the benefits of recess, especially unstructured playtime (14, 29, 43). Research has looked into not only allotting time for children to have recess, but also the provision of equipment.

© 2020 Global Journals

Children tend to be more active during recess and after school when they are encouraged by their teachers and given access to equipment that aids in free-time play (5, 58, 59, 75). The conclusion here is to bring back recess in appropriate amounts to balance both the physical activity and the educational needs of children.

Another societal change to observe in physical activity is infrastructure. Individuals are influenced by their environment. A city built to be more active will see people become more active, whereas a city built to accommodate technological advances may prove to be more dangerous for the occurrence of physical activity. Some examples of infrastructure could be sidewalks, bike lanes, parks/playgrounds, etc. For cities that do not build these infrastructures into their city plan, not only is it more dangerous for people to be active (having to walk/run on the road, children playing in the streets), but it doesn't promote physical activity. Many studies have looked at infrastructure and generally find that places without these infrastructures in place tend to promote inactivity (12, 17, 33).

Obesity is multi-causal. Physical activity is good, but only a piece of the solution. We also have to consider the diet aspect of obesity. As we have previously seen, Americans are over-consuming in amounts and types. Many studies have observed the changes that occur when small changes are made to diet (they also increase physical activity). These studies most commonly decrease sugar intake (60). The time of day food eaten is another factor being explored. Sofer, Stark, and Madar (2014) conducted a study regarding the time of day and suggested that timing (and what is consumed at that time) might play a big role in abdominal obesity (69). Researchers have also explored different types of diets (e.g., Mediterranean Diet) to find associations between diet and decreased obesity and disease rates (37). While many of these studies are promising in providing possible solutions, it is ultimately up to the individual to enact these changes in their own life.

The 2015-2020 Dietary Guidelines for Americans help to outline a healthy diet for Americans to follow by reducing the bad and increasing the good. These national guidelines put forth by the U.S. Department of Health and Human Services are an effort to provide directions for Americans to make healthy personal decisions regarding their diet (24). It is up to an individual to decide how much, what type, where, and when to eat. But we can provide resources for individuals to consider when they are making this choice.

Studies have observed when small changes are implemented in the diet, like reduced sugar intake, the health and well-being of individuals increases. In response to this, many have posed the question of taxing sugar to help reduce rising rates of obesity. Some countries have started implementing this (63, 64). However, the effectiveness of this tactic is questioned. It does not appear to bring out the desired effect. Instead of imposing negative consequences on undesirable behaviors, society should focus on discouraging these behaviors while encouraging and emphasizing positive, healthy behaviors.

Certainly, this is not an exhaustive list of problems and solutions. The obesity epidemic is a complex situation that requires a complex answer. It does cause one to ponder, however, why some of these changes occurred in the first place. We noted that increased portion sizes and the use of saturated fats and sugars have contributed to the growing obesity problem. In comparison to the 1950s, we consume larger portions and foods laden with calories but lacking appropriate nutrients. Why? There are so many studies looking at the effects of portion size and food type, but there are none to show why the nation started making these changes in the first place. What caused the shift in our diets? We see the reasons for shifts in physical activity and exercise, but we have not seen the reasons behind restaurants and families increasing portion sizes. Future research should include these questions as part of their study. If we are unable to locate the source of the problem, how do we expect to fix it? One cannot treat an issue symptomatically and assume the underlying cause will be cured. Understanding the reasons why these changes occurred can help to produce a whole solution versus the symptomatic solutions we currently have.

© 2020 Global Journals

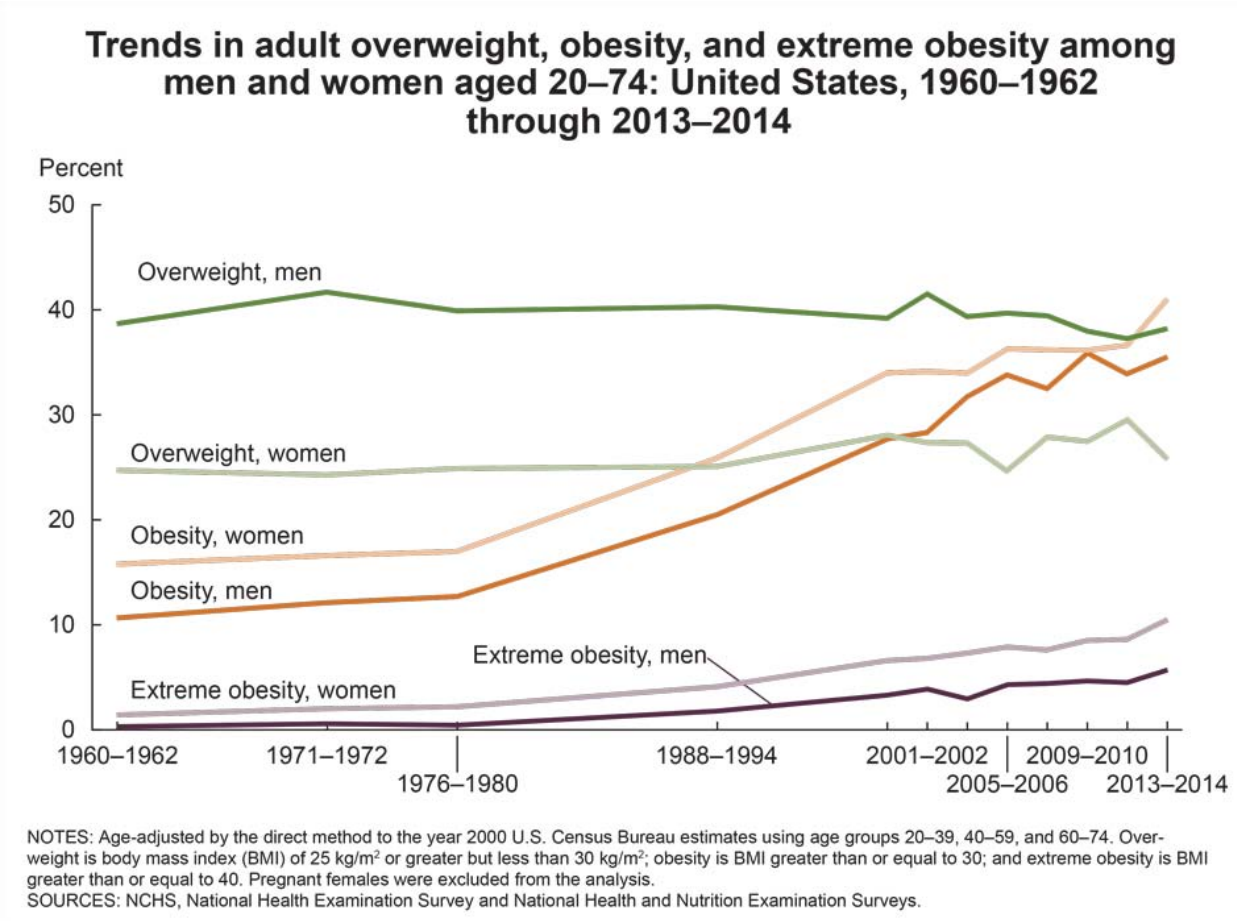

Figure 1: Obesity Trends in America Over Time

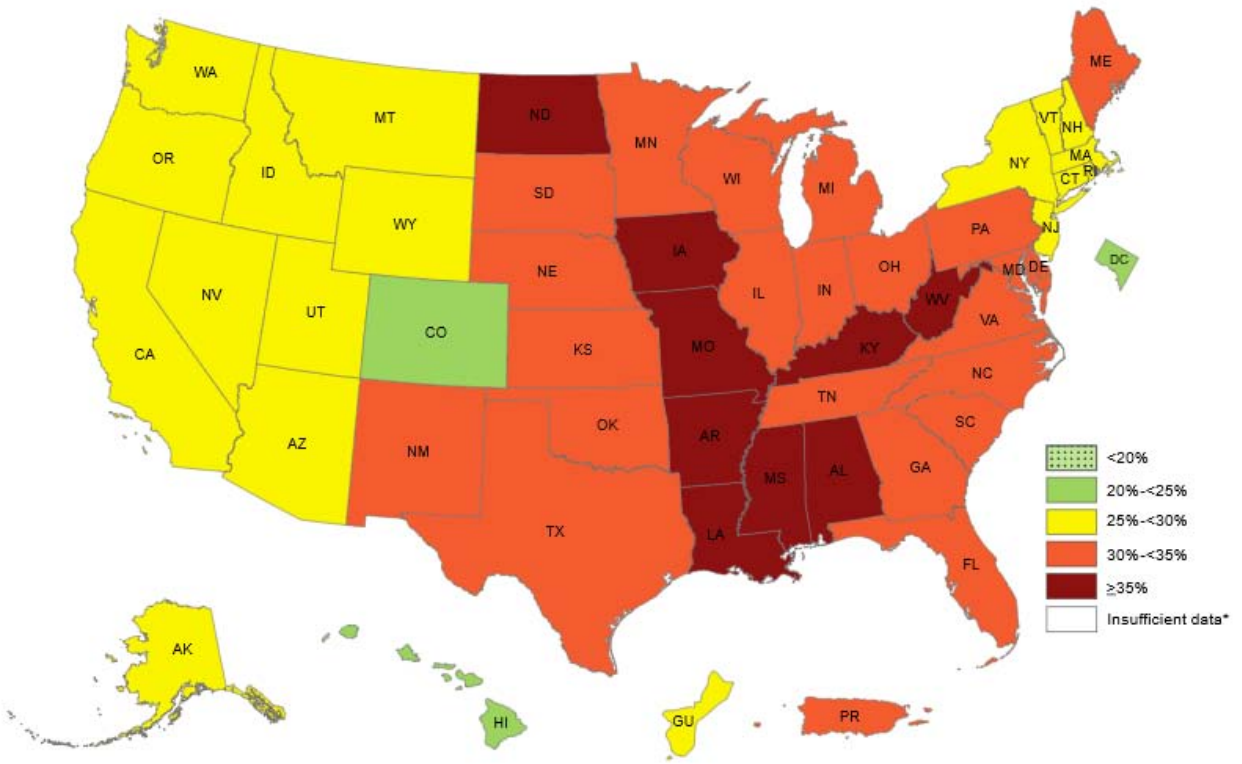

Figure 2: Obesity Prevalence in the US 2018

© 2020 Global Journals

2008 Physical Activity Guidelines for Americans



Trends in Meeting the 2008 Physical Activity Guidelines, 2008—2018 Percentage (95% Confidence Interval)												
2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Overall Trend*	Period-Specific Trends*
Adults engaging in no leisure-time physical activity												
36.2 (35.0-37.4)	32.3 (31.3-33.3)	32.4 (31.5-33.3)	31.6 (30.7-32.5)	29.6 (28.8-30.5)	30.3 (29.5-31.1)	30.0 (29.1-30.9)	30.0 (29.2-30.9)	26.9 (25.7-28.1)	25.9 (24.6-27.2)	25.4 (24.3-26.6)	↓ -0.9/year	None
Adults meeting minimum aerobic physical activity guideline—Moderate-intensity for ≥ 150 minutes/week, or vigorous-intensity for ≥ 75 minutes/week, or an equivalent combination												
43.5 (42.4-44.6)	47.2 (46.2-48.2)	47.1 (46.2-48.0)	48.8 (47.9-49.7)	50.0 (49.1-50.8)	49.9 (49.1-50.8)	49.9 (49.0-50.8)	49.8 (48.9-50.6)	52.6 (51.5-53.7)	54.1 (52.9-55.2)	54.2 (53.2-55.3)	↑ 0.9/year	None
Adults meeting high aerobic physical activity guideline—Moderate-intensity for > 300 minutes/week, or vigorous-intensity for > 150 minutes/week, or an equivalent combination												
28.4 (27.5-29.4)	31.2 (30.4-32.1)	31.7 (30.9-32.5)	33.1 (32.4-34.0)	34.3 (33.5-35.1)	34.3 (33.5-35.2)	34.0 (33.2-34.9)	33.6 (32.7-34.4)	35.9 (34.9-36.9)	37.0 (36.0-38.1)	37.4 (36.4-38.4)	↑ 0.7/year	↑2008-2012 (1.3/year) ↔ 2012-2015 ↑2015-2018 (1.2/year)
Adults meeting muscle-strengthening guideline—Muscle-strengthening activities ≥ 2 days/week												
21.9 (21.2-22.7)	22.6 (21.8-23.3)	24.2 (23.4-24.9)	24.2 (23.5-24.9)	23.9 (23.2-24.5)	24.1 (23.4-24.9)	24.4 (23.7-25.2)	24.8 (24.2-25.5)	26.0 (25.1-26.9)	27.7 (26.8-28.6)	27.6 (26.8-28.5)	↑ 0.5/year	↑2008—2010 (1.1/year) ↔ 2010—2014 ↑2014—2018 (0.9/year)
Adults meeting guidelines for aerobic physical activity and muscle-strengthening activity												
18.2 (17.5-19.0)	19.0 (18.3-19.7)	20.6 (19.9-21.3)	20.8 (20.2-21.5)	20.6 (20.0-21.2)	20.8 (20.1-21.4)	21.3 (20.6-22.0)	21.4 (20.8-22.1)	22.5 (21.7-23.3)	24.3 (23.5-25.2)	24.0 (23.2-24.9)	↑ 0.5/year	None
Adolescents meeting aerobic physical activity guideline—Physically active ≥ 60 minutes per day on 7 days/week												
-	-	-	28.7 (27.1-30.3)	-	27.1 (25.5-28.8)	-	27.1 (25.4–28.8)	-	26.1 (24.1–28.3)	-	↔	None
Adolescents meeting guideline for muscle-strengthening activity—Muscle-strengthening activities on ≥ 3 days/week												
-	-	-	55.6 (53.6-57.5)	-	51.7 (49.6-53.9)	-	53.4 (51.1–55.6)	-	51.1 (47.5–54.7)	-	↔	None
Adolescents meeting guidelines for aerobic physical activity and muscle-strengthening activity												
-	-	-	21.9 (19.9-23.9)	-	21.6 (19.6-23.8)	-	20.5 (18.4-22.7)	-	20.0 (17.2, 23.0)	-	↔	None

Figure 3: Physical Activity Guidelines

Bibliography

1. About Adult BMI. (2017, August 29). Retrieved from https://www.cdc.gov/healthyweight/assessing/bmi/adult_bmi/index.html.
2. Adult Obesity Prevalence Maps. (2019, October 29). Retrieved from https://www.cdc.gov/obesity/data/prevalence-maps.html#overall.
3. Adult Obesity Facts. (2018, August 13). Retrieved from https://www.cdc.gov/obesity/data/adult.html.
4. An Epidemic of Obesity: U.S. Obesity Trends. (2016, April 12). Retrieved from https://www.hsph.harvard.edu/nutritionsource/an-epidemic-of-obesity/.
5. Beighle, A., Morgan, C. F., Masurier, G. L., & Pangrazi, R. P. (2006). Childrens Physical Activity During Recess and Outside of School. *Journal of School Health*, *76*(10), 516–520. doi: 10.1111/j.1746-1561.2006.00151.x
6. Birchwood, D., Roberts, K., & Pollock, G. (2008, October 1). Explaining differences in sport participation rates among young adults: Evidence from the South Caucasus. *European Physical Education Review*, *14*(3), 283–298. doi: 10.1177/1356336x08095667.
7. Blair, S. N., Dunn, A. L., Marcus, B. H., Carpenters, R. A., Jaret, P., & Pate, R. R. (2011). *Active living every day*. Champaign, IL: Human Kinetics.
8. Bureau of Labor Statistics, U.S. Department of Labor (2017, April 10). Physical strength required for jobs in different occupations in 2016, *The Economics Daily*. Retrieved from https://www.bls.gov/opub/ted/2017/physical-strength-required-for-jobs-in-different-occupations-in-2016.htm
9. Casper, J. (2007). Sport Commitment, Participation Frequency and Purchase Intention Segmentation based on Age, Gender, Income and Skill Level with US Tennis Participants. *European Sport Management Quarterly*, *7*(3), 269–282. doi: 10.1080/16184740701511110.
10. Centers for Disease Control and Prevention. National Center for Chronic Disease Prevention and Health Promotion, Division of Nutrition, Physical Activity, and Obesity. Data, Trend and Maps [online]. URL: https://www.cdc.gov/nccdphp/dnpao/data-trends-maps/index.html.
11. Church, T. S., Thomas, D. M., Tudor-Locke, C., Katzmarzyk, P. T., Earnest, C. P., Rodarte, R. Q., … Bouchard, C. (2011, May 25). Trends over 5 Decades in U.S. Occupation-Related Physical Activity and Their Associations with Obesity. *PLoS ONE*, *6*(5). doi: 10.1371/journal.pone.0019657.
12. Dill, J. (2009, February 2). Bicycling for Transportation and Health: The Role of Infrastructure. *Journal of Public Health Policy*, *30*(S1). doi: 10.1057/jphp.2008.56
13. Eime, R. M., Young, J. A., Harvey, J. T., Charity, M. J., & Payne, W. R. (2013, August 15). A systematic review of the psychological and social benefits of participation in sport for children and adolescents: informing development of a conceptual model of health through sport. *International Journal of Behavioral Nutrition and Physical Activity*, *10*(1), 98. doi: 10.1186/1479-5868-10-98.

© 2020 Global Journals

14. Every Student Succeeds Act (ESSA). (n.d.). Retrieved from https://www.ed.gov/essa?src=rn.
15. Federico, R. A. (2017, March 14). Get Up, Stand Up: A Brief History of Sedentarism and Why Movement is Good Medicine. *Journal of Evolution and Health*, *2*(1). doi: 10.15310/2334-3591.1061.
16. Fisher, N. (2019, March 7). Americans Sit More Than Anytime In History And It's Literally Killing Us. Retrieved from https://www.forbes.com/sites/nicolefisher/2019/03/06/americans-sit-more-than-anytime-in-history-and-its-literally-killing-us/#78b06550779d.
17. Forsyth, A., Oakes, J. M., Schmitz, K. H., & Hearst, M. (2007, April 1). Does Residential Density Increase Walking and Other Physical Activity? *Urban Studies*, *44*(4), 679–697. doi: 10.1080/00420980601184729
18. Fuller, J. (2008, July 7). Why did cars become the dominant form of transportation in the United States? Retrieved from https://auto.howstuffworks.com/cars-dominant-form-transportation.htm.
19. Gerald, L. B., Anderson, A., Johnson, G. D., Hoff, C., & Trimm, R. F. (1994, May). Social class, social support and obesity risk in children. *Child: Care, Health and Development*, *20*(3), 145–163. doi: 10.1111/j.1365-2214.1994.tb00377.x.
20. González-Gross, Marcela, & Meléndez, Agustín (2013). Sedentarism, active lifestyle and sport: impact on health and obesity prevention. *Nutrición Hospitalaria*, 28(5), 89-98. ISSN: 0212-1611.
21. Green, N. (2016, April 11). Please Leave Your Office: The Danger of a Standing Desk. Retrieved from https://www.linkedin.com/pulse/please-leave-your-office-danger-standing-desk-green-m-s-bcba/.
22. Guthrie, J. F., Lin, B.-H., & Frazao, E. (2002). Role of Food Prepared Away from Home in the American Diet, 1977-78 versus 1994-96: Changes and Consequences. *Journal of Nutrition Education and Behavior*, *34*(3), 140–150. doi: 10.1016/s1499-4046(06)60083-3.
23. Henry, T. A. (2018, November 26). Adult obesity rates rise in 6 states, exceed 35% in 7. Retrieved from https://www.ama-assn.org/delivering-care/public-health/adult-obesity-rates-rise-6-states-exceed-35-7.
24. HHS Office, & Council on Sports. (2017, January 26). Dietary Guidelines for Americans. Retrieved from https://www.hhs.gov/fitness/eat-healthy/dietary-guidelines-for-americans/index.html.
25. Jebb, S. A., & Moore, M. S. (1999, October 31). Contribution of a sedentary lifestyle and inactivity to the etiology of overweight and obesity: current evidence and research issues. *Medicine & Science in Sports & Exercise*, *31*(Supplement 1), 534–541. doi: 10.1097/00005768-199911001-00008.
26. Kandola, A. (2018, August 29). Sedentary lifestyle: Effects, solutions, and statistics. Retrieved from https://www.medicalnewstoday.com/articles/322910.php.
27. Keim, N. L., Blanton, C. A., & Kretsch, M. J. (2004, September). America's obesity epidemic: Measuring physical activity to promote an active lifestyle. *Journal of the American Dietetic Association*, *104*(9), 1398–1409. doi: 10.1016/j.jada.2004.06.005.
28. Kids Sports Facts: Sports Participation Rates. (n.d.). Retrieved from https://www.aspenprojectplay.org/kids-sports-participation-rates.
29. Klein, A. (2015, April 10). No Child Left Behind: An Overview. *Education Week.* Retrieved Month Day, Year from https://www.edweek.org/ew/section/multimedia/no-child-left-behind-overview-definition-summary.html
30. Kumar, S., Kroon, J., Lalloo, R., Kulkarni, S., & Johnson, N. W. (2016). Relationship between body mass index and dental caries in children, and the influence of socio-economic status. *International Dental Journal*, *67*(2), 91–97. doi: 10.1111/idj.12259.
31. Lee, A. (2016, October 21). 7 Charts that Show the State of Youth Sports in the US and Why it Matters. Retrieved from https://www.aspeninstitute.org/blog-posts/7-charts-that-show-the-state-of-youth-sports-in-the-us-and-why-it-matters/.
32. Lock, S. (2019, February 21). QSR: consumer spending US 2018. Retrieved from https://www.statista.com/statistics/259148/consumer-spending-us-qsr-sector/.
33. Lopez, R. P., & Hynes, H. P. (2006, September 2016). Obesity, physical activity, and the urban environment: public health research needs. *Environmental Health*, *5*(1). doi: 10.1186/1476-069x-5-25
34. Manson, J. E., Skerrett, P. J., Greenland, P., & Vanitallie, T. B. (2004, February 9). The Escalating Pandemics of Obesity and Sedentary Lifestyle. *Archives of Internal Medicine*, *164*(3), 249. doi: 10.1001/archinte.164.3.249.
35. Matthews, C. E., Chen, K. Y., Freedson, P. S., Buchowski, M. S., Beech, B. M., Pate, R. R., & Troiano, R. P. (2008, February 25). Amount of Time Spent in Sedentary Behaviors in the United States, 2003-2004. *American Journal of Epidemiology*, *167*(7), 875–881. doi: 10.1093/aje/kwm390.
36. McDonnell, T. (2019, October 17). Childhood Obesity Is Rising 'Shockingly Fast' - Even In Poor Countries. Retrieved from https://www.npr.org/sections/goatsandsoda/2019/10/17/770905500/childhood-obesity-is-rising-shockingly-fast-even-in-poor-countries.
37. Mendez, M. A., Popkin, B. M., Jakszyn, P., Berenguer, A., Tormo María José, Sanchéz María José … González Carlos A. (2006). Adherence to a Mediterranean Diet Is Associated with Reduced 3-

© 2020 Global Journals

Year Incidence of Obesity. *The Journal of Nutrition*, *136*(11), 2934–2938. doi: 10.1093/jn/136.11.2934.
38. Moore, M. E., Stunkard, A., & Srole, L. (1997, September 5). Obesity, Social Class, and Mental Illness. *Obesity Research*, *5*(5), 503–508. doi: 10.1002/j.1550-8528.1997.tb00678.x.
39. Mozaffarian D, Benjamin EJ, Go AS, Arnett DK, Blaha MJ, Cushman M, Das SR, de Ferranti S, Després J-P, Fullerton HJ, Howard VJ, Huffman MD, Isasi CR, Jiménez MC, Judd SE, Kissela BM, Lichtman JH, Lisabeth LD, Liu S, Mackey RH, Magid DJ, McGuire DK, Mohler ER III, Moy CS, Muntner P, Mussolino ME, Nasir K, Neumar RW, Nichol G, Palaniappan L, Pandey DK, Reeves MJ, Rodriguez CJ, Rosamond W, Sorlie PD, Stein J, Towfighi A, Turan TN, Virani SS, Woo D, Yeh RW, Turner MB; on behalf of the American Heart Association Statistics Committee and Stroke Statistics Subcommittee. Heart disease and stroke statistics—2016 update: a report from the American Heart Association. Circulation. 2016; 133 (4):e38-e360.
40. Nielsen, S. J., & Popkin, B. M. (2004, October). Changes in beverage intake between 1977 and 2001. *American Journal of Preventive Medicine*, *27*(3), 205–210. doi: 10.1016/j.amepre.2004.05.005.
41. Nielsen, S. J., & Popkin, B. M. (2003, January). Patterns and Trends in Food Portion Sizes, 1977-1998. *JAMA*, *289*(4), 450–453. doi: 10.1001/jama.289.4.450
42. Nielsen, S. J., Siega-Riz, A. M., & Popkin, B. M. (2002, August). Trends in Food Locations and Sources among Adolescents and Young Adults. *Preventive Medicine*, *35*(2), 107–113. doi: 10.1006/pmed.2002.1037.
43. No Time for Recess, No Need for Nap. (n.d.). Retrieved from https://fairtest.org/no-time-recess-no-need-nap.
44. Office of Minority Health. (n.d.). Retrieved from https://minorityhealth.hhs.gov/omh/browse.aspx?lvl=4&lvlid=48.
45. Office of Minority Health. (n.d.). Retrieved from https://minorityhealth.hhs.gov/omh/browse.aspx?lvl=3&lvlid=63.
46. Office of Minority Health. (n.d.). Retrieved from https://minorityhealth.hhs.gov/omh/browse.aspx?lvl=4&lvlid=70
47. Office of Minority Health. (n.d.). Retrieved from https://minorityhealth.hhs.gov/omh/browse.aspx?lvl=4&lvlid=64
48. Office of Minority Health. (n.d.). Retrieved from https://minorityhealth.hhs.gov/omh/browse.aspx?lvl=4&lvlid=63
49. Office of Minority Health. (n.d.). Retrieved from https://minorityhealth.hhs.gov/omh/browse.aspx?lvl=3&lvlid=64
50. Office of Minority Health. (2016, January 28). Retrieved from https://minorityhealth.hhs.gov/omh/browse/aspx?1v1=4&lvlid=19
51. Office of Minority Health. (2016, July 13). Retrieved from https://minorityhealth.hhs.gov/omh/browse/aspx?lvl=4&lvlid=18
52. Office of the Surgeon General (US). The Surgeon General's Vision for a Healthy and Fit Nation. Rockville (MD): Office of the Surgeon General (US); 2010.
53. Ogden, C. L., Carroll, M. D., Kit, B. K., & Flegal, K. M. (2012, January 17). Prevalence of Obesity and Trends in Body Mass Index among US Children and Adolescents, 1999-2010. *JAMA*, *307*(5), 483–490. doi: 10.1001/jama.2012.40
54. Overweight & Obesity Statistics. (2017, August 1). Retrieved from https://www.niddk.nih.gov/health-information/health-statistics/overweight-obesity.
55. Owen, N., Sparling, P. B., Healy, G. N., Dunstan, D. W., & Matthews, C. E. (2010, December). Sedentary Behavior: Emerging Evidence for a New Health Risk. *Mayo Clinic Proceedings*, *85*(12), 1138–1141. doi: 10.4065/mcp.2010.0444.
56. Paeratakul, S., Ferdinand, D. P., Champagne, C. M., Ryan, D. H., & Bray, G. A. (2003, October). Fast-food consumption among US adults and children: Dietary and nutrient intake profile. *Journal of the American Dietetic Association*, *103*(10), 1332–1338. doi: 10.1016/s0002-8223(03)01086-1
57. Ramstetter, C. L., Murray, R., & Garner, A. S. (2010, October 7). The Crucial Role of Recess in Schools. *Journal of School Health*, *80*(11), 517–526. doi: 10.1111/j.1746-1561.2010.00537.x
58. Ridgers, N. D., Salmon, J., Parrish, A.-M., Stanley, R. M., & Okely, A. D. (2012, September). Physical Activity during School Recess. *American Journal of Preventive Medicine*, *43*(3), 320–328. doi: 10.1016/j.amepre.2012.05.019
59. Rodearmel, S. J., Wyatt, H. R., Stroebele, N., Smith, S. M., Ogden, L. G., & Hill, J. O. (2007, October). Small Changes in Dietary Sugar and Physical Activity as an Approach to Preventing Excessive Weight Gain: The America on the Move Family Study. *Pediatrics*, *120*(4), 869–879. doi: 10.1542/peds.2006-2927.
60. Rolls, B. J., Roe, L. S., & Meengs, J. S. (2006, April). Larger Portion Sizes Lead to a Sustained Increase in Energy Intake Over 2 Days. *Journal of the American Dietetic Association*, *106*(4), 543–549. doi: 10.1016/j.jada.2006.01.014.
61. Rolls, B. J. (2003). The Supersizing of America. *Nutrition Today*, *38*(2), 42–53. doi: 10.1097/00017285-200303000-00004.
62. Ryan, P. (2019, November 26). More adults than youngsters back UAE's expanded 'sugar tax'. Retrieved from https://www.thenational.ae/uae/

© 2020 Global Journals

health/more-adults-than-youngsters-back-uae-s-expanded-sugar-tax-1.942782.
63. Sarlio-Lähteenkorva, S., & Winkler, J. T. (2015, July 29). Could a sugar tax help combat obesity? *Bmj*(351). doi: 10.1136/bmj.h4047.
64. Schlosser, E. (2012). *Fast food nation: the dark side of the all-American meal*. Boston: Mariner Books/ Houghton Mifflin Harcourt.
65. Smiciklas-Wright, H., Mitchell, D. C., Mickle, S. J., Goldman, J. D., & Cook, A. (2003, January). Foods commonly eaten in the United States, 1989-1991 and 1994-1996: Are portion sizes changing? *Journal of the American Dietetic Association*, *103*(1), 41–47. doi: 10.1053/jada.2003.50000.
66. Smith, L.P., Ng, S.W. & Popkin, B.M (2013, April 11). Trends in US home food preparation and consumption: analysis of national nutrition surveys and time use studies from 1965–1966 to 2007–2008. *Nutrition Journal,* 12(45). doi:10.1186/1475-2891-12-45.
67. Socioeconomic Status. (n.d.). Retrieved from https://www.apa.org/topics/socioeconomic-status/.
68. Sofer, S., Stark, A. H., & Madar, Z. (2015, March). Nutrition Targeting by Food Timing: Time-Related Dietary Approaches to Combat Obesity and Metabolic Syndrome. *Advances in Nutrition*, *6*(2), 214–223. doi: 10.3945/an.114.007518.
69. Stephens, M. (2000). History of Television. *Grolier Multimedia Encyclopedia*. Retrieved from https:// www.nyu.edu/classes/stephens/History of Television page.htm.
70. The Staggering Effects of Physical Inactivity. (2013, July 23). Retrieved from https://www.yourethecure.org/the-staggering-effects-of-physical-inactivity.
71. The State of Obesity 2018: Better Policies for a Healthier America. (n.d.). Retrieved from https:// www.tfah.org/report-details/the-state-of-obesity-2018/.
72. Ullrich-French, S., & Smith, A. L. (2009, January). Social and motivational predictors of continued youth sport participation. *Psychology of Sport and Exercise*, *10*(1), 87–95. doi: 10.1016/j.psychsport.2008.06.007.
73. U.S. Department of Health and Human Services. Physical Activity Guidelines for Americans, 2nd edition. Washington, DC: U.S. Department of Health and Human Services; 2018.
74. Verstraete, S. J. M., Cardon, G. M., Clercq, D. L. R. D., & Bourdeaudhuij, I. M. M. D. (2006, January 23). Increasing childrens physical activity levels during recess periods in elementary schools: the effects of providing game equipment. *European Journal of Public Health*, *16*(4), 415–419. doi: 10.1093/eurpub/ckl008
75. Young, L. R., & Nestle, M. (2002, February). The Contribution of Expanding Portion Sizes to the US Obesity Epidemic. *American Journal of Public Health*, *92*(2), 246–249. doi: 10.2105/ajph.92.2.246.
76. Zimmermann-Sloutskis, D., Wanner, M., Zimmermann, E., & Martin, B. W. (2010, January 11). Physical activity levels and determinants of change in young adults: A longitudinal panel study. *International Journal of Behavioral Nutrition and Physical Activity*, *7*(1), 2. doi: 10.1186/1479-5868-7-2.
77. (n.d.). Retrieved from http://www.buffalohistory.org/Explore/Exhibits/virtual_exhibits/wheels_of_power/index_no_flash.htm.

© 2020 Global Journals