

Research Article

Factors that are associated with the development of obesity in children

Abstract

The objective of this paper is to discuss the definition, overview, prevalence, and the factors associated with the development of obesity in children. Childhood obesity has hazardous factors such as depression, lack of self-esteem, body unhappiness and eating disorder symptoms that is controlled by elements such as age, gender, family characteristics such as parenting lifestyle, and environmental factors such as school policies and demographics. Obesity in children is a health condition that affects many low and middle income communities, especially in urban places. Reducing the epidemic of obesity in children is very essential by making healthier choices in one's life.

Keywords: obesity, children, factors, symptoms, health, diet, exercise, nutrition

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Abbreviations: BMI, body mass index; NHANES, national health and nutrition examination survey; ALT, alanine amino transferase; INSIG 2, insulin-induced gene 2

Introduction

Childhood obesity is a condition that appears when a child is above the normal weight for his or her age group. Obesity in children serves as a key public health problem that affect's children's physical health, happiness, and self-confidence. The definition of obesity is the increase in body fat as a result of excess calorie intake and lack of physical activity. Childhood obesity takes place when a child has a lack of self-appreciation and unhappiness. In order to lessen or lower childhood obesity, the parents of that child has to enhance the diet and exercise pattern for that child.

In the article "Reducing obesity: motivating action while not blaming the victim" by Alder NE, Stewart J,¹ the authors state that "the increase in obesity in the United States may slow the long-term progression or direction of increasing life expectancy."¹ This means that reducing obesity is very vital in order for a child to live a long, healthy and prosperous life. The authors also makes a point that "Obesity results from health damaging behavior especially among women from low-income communities, those with less education, and ethnic and racial backgrounds."¹ This means that women who come from ethnic and racial backgrounds that are from non-affluent communities and with a reduced amount of education take part in a large sugar intake by sugary drinks, less physical activity, and excessive food intake, which causes a child to follow into their mother's footsteps, which sets a bad example for that child.

In the article "Prevalence and Trends in Obesity and Severe Obesity Among Children in the United States" by Skelton JA, Skinner AC,² the authors state that "we used height and weight as measured during the examination component to calculate age-and sex-specific BMI percentile (calculated as weight in kilograms divided by height in meters squared)."² The authors are saying that the Body Mass

Index (BMI) for children is determined by the age and gender of that child. A child's weight estimation uses an age-and-gender specific percentile for BMI because children's body makeup differs as they age. In the article "Trajectories and Transitions in Childhood and Adolescent Obesity" by Firestone R, Howe LD, Lawlor DA, Tilling K, the authors state that "since BMI changes in childhood, it can result in changes in height and weight." In other words, when using age-and-gender specific percentile, one can determine the BMI for any child. In the graph, "Different Estimates of the Prevalence of Obesity among US Adolescents", from the National Health and Nutrition Examination Survey (NHANES), statistics illustrate the body mass index (BMI) measured from self-reported height and weight amongst youngsters in 9th to 12th grade. For progenies, obesity is well-defined as a BMI greater than or equal to the age-and gender-specific 95th percentile standard.

According to the article "Obesity Prevalence in the United States- Up, Down, or Sideways?" by Yanovski JA et al.,³ the author's state that "the prevalence of obesity among children and girls ages 2 to 19 years of age (16.9%) has remained stable over the past 10 years and the prevalence among boys (32.2%) has not changed significantly."³ This means that the incidence of obesity among boys and girls are steady which is a good sign indicating that the prevalence of obesity among boys and girls are improving. According to Table 1, "Distribution of Demographic Characteristics and Obesity Prevalence by Demographic Characteristics for All Participants", the results state that "Older children and non-Hispanic black and Hispanic children had higher prevalence rates of overweight and obesity as well as both class 2 and class 3 obesity in the group of all years pooled."³ This means that Hispanic and black youths have the largest incidence of obesity than Whites.

The authors also states that "32.2% of children in the United States aged 2 to 19 years were overweight and 17.3% were obese. Additionally, 5.9% of children met criteria for class 2 obesity and 2.1% met criteria for class 3 obesity."³ This means that there is a distinction in percentage of youngsters or progenies who are overweight and obese. Moreover, progenies who meet the benchmark or standard are

grouped in the order of which class a youngster belongs. The author also makes a point that the “prevalence rates of overweight, obesity, and class 2 obesity are increasingly significant among Hispanic females and black males.”³ This means that the occurrence of obesity has escalated within the minority groups over the past decade.

According to the article “Prevalence of Childhood and Adult Obesity in the United States” by Carrol MD & Kit BK et al.,⁴ the authors state that “the prevalence of obesity among infants and toddlers from birth to age 2 years was 8.1%.”⁴ This means that the incidence of obesity among newborns and babies are small which is an extremely excellent sign that it is getting better. The author also states that “the prevalence of obesity in the United States is high, with 17% of children obese; it appears to have leveled off in the years of 2009 and 2010.”⁴ This means that the incidence of obesity is elevating and it is essential that the prevalence of obesity is maintained and monitored at all times. The author also makes a point that the “prevalence of obesity was lower among non-Hispanic white youth compared with non-Hispanic black youth ($P=0.048$) and Hispanic youth ($P<0.001$).”⁴ This means that non-Hispanic white (racially white) youngsters have diminished or declined the prevalence of obesity as opposed to non-Hispanic black (African-Americans).

In the article “Trajectories and Transitions in Childhood and Adolescent Obesity” by Firestone R, Howe LD, Lawlor DA, Tilling K, the authors state that “the prevalence of both overweight and obesity continued to rise from ages 9 to 19 years in both black and white females, with very large increases in the late teenage years in an analysis of 2,379 school children in the United States.” In other words, childhood obesity is proliferating and one needs to observe the prevalence of obesity in children so that it does not skyrocket. The authors also make a point that “at age nine, 30.6% of black females and 22.4% of white females were overweight, rising to 39.3% and 24.1% respectively at age 16 and 56.9% and 41.3% at age 19.” This means that one has to stabilize the prevalence of obesity before it rises abruptly and rapidly.

The origination and development of childhood obesity is very difficult regarding different reciprocations among genetics factors. According to the article “HIF3A DNA Methylation Is Associated with Childhood Obesity and ALT” by Ma J, Song Y, Wang H, Wang S, Yang Y, Zhang Y, the authors state that “inheritance could account for up to 40-70% of the inter individual variability in body weight.” In other words, the individual’s trait that is genetically transferred from parent to child makes up 40-70% of an individual’s body makeup. The authors also makes a point that “methylation levels in obese children were significantly higher than in controls at positions 46801642 and 46801699 in HIF3A gene ($P<0.05$), and found positive associations between methylation and alanine amino transferase (ALT) levels adjusted by gender, age and BMI at position 46801699 ($r=0.226$, $P=0.007$).” (Ma, Song, Wang, Yang, Zhang, 2015). The author is saying that if you find a certain substance in the person’s gene at higher than normal, the person is at risk for obesity.

In the article “Genetics of Childhood Obesity” by Grant SFA et al.,⁵ the authors state that “insulin-induced gene 2 (INSIG 2) was the first locus to be reported by this method to have a role in obesity but replication attempts have yielded inconsistent outcomes. A common genetic variant with modest relative risk ($RR\approx 1.2$), rs7566605, near the INSIG 2 gene has described to be associated with childhood obesity from a GWAS (Genome-wide association study) 100,000 SNPs.”⁵ The author is saying that the insulin genetic form is adjacent

or close to the INSIG 2 that is linked to childhood obesity. Moreover, the duplication process is not reliable or dependable to a point that the insulin gene will not produce an effective result. The author also states that “studies from both FTO knockout and FTO over expression mouse model support the fact that FTO is directly involved in the regulation of energy intake metabolism in mice, where the lack of FTO expression leads to leanness while enhanced expression of FTO leads to obesity.”⁵ This means that the insufficiency of the FTO gene variation results in a deficiency or shortfall while a buildup of FTO expression points to fatness or chubbiness.

In the article “An Obesity-Associated FTO Gene Variant and Increased Energy Intake in Children” by Cecil JE & Hetherington MM et al.,⁶ the authors state that “children carrying the A allele had somewhat higher measures of waist and hip circumference than children who did not have the A allele, but the differences were not significant.”⁶ This means that the scientific measurements of youngsters with waist and hip boundary has a larger or bigger value within the A allele. Moreover, the mathematical size of youngsters who have the A allele is distinct or unique. The authors also state that “the children who carried the A allele had an estimated fat mass that was 1.78 kg greater than that of non-carriers ($P=0.01$) and an estimated lean mass that was less than 400g greater than that of non-carriers ($P=0.46$).”⁶ In other words, youngsters that carried the A allele had a heavy quantity larger than the progenies who are not carrying the A allele and a lean mass smaller than 0.4 kg bigger than that of the youngsters that are not carrying the A allele. The author also makes a point that “the children carrying the A allele ingested more energy-dense foods than did the children who were not carrying the A allele, indicating a preference for energy-dense foods.”⁶ This means that infants having the A allele consumed extra nourishments than the progenies that did not have the A allele.

According to the article “An after-school exercise program improves fitness, and body composition in elementary school children” by Baldwin S & Carrel AL et al.,⁷ the authors state that “improving health in children should include a focus on increasing physical activity, in addition to encouraging healthy eating for health promotion.”⁷ This means that when you exercise and also participate in extracurricular activities, it will enhance the progenies health in the long run. Exercising is a part of a daily routine that a child must do on a daily basis. The parents of that child must teach the child that exercise is an excellent form of physical activity that must be done to strengthen or supplement the child’s health.

The author also makes a point that “the most successful programs are those that incorporate activity into the child’s lifestyle, as part of the family and school environment.”⁷ This means that programs that have physical activity in a youngster or progenies life is vital in schools and also in a family surroundings. The authors also state that “school based fitness programs can significantly improve cardiovascular fitness levels, and body composition in young children.”⁷ This means that implementations of an institution or departmental exercise program develops or increases heart fitness levels and body makeup in offspring’s.

The authors also state that “an effective public health approach would also promote increased physical activity outside of school and throughout the summer months, as physical activity recommendations cannot be met through physical education classes alone.”⁷ In other words, youngster will need to go to fitness programs that are around their community and they can’t be in their own institution. Moreover,

physical education classes in any institution alone will not assist the youngster to improve their health because of the limited time the progeny has to complete an effective workout. When I was a child, the physical education classes we had to take lasted an hour and fifteen minutes long which is not enough time to execute a proper physical activity.

In the article “The effect of twelve week aerobic exercise programme on health related physical fitness components and blood lipids in obese girls” by Ozturk MI et al.,⁸ the authors state that “12 weeks of aerobic training improved insulin sensitivity in overweight and obese girls without any significant changes in body weight, body fat percent and circulating concentrations of adiponectin, IL-6, CRP, and other inflammatory markers.”⁸ This means that fitness training for twelve weeks enhanced obese girls and it did not disrupt their body makeup, body fat measurement, and their provocative pointers. The author also makes a point that “the regular aerobic exercise may affect health related fitness components and blood lipids positively in girls. Furthermore, it may result in decreasing obesity in girls.”⁸ In other words, when a progeny does aerobic exercise on a daily basis, it will have a major impact on a child’s life tremendously. Moreover, exercise reduces obesity in girls and assist girls in improving their everyday lifestyle.

The author also makes a point that “the effects of aerobic exercise on obese children (N=49) aged 8 to 12 years. They found that there was significant increase in the aerobic capacity (P<0.001).”⁸ In other words, physical activity on obese youngsters had higher or larger oxygen consumption in obese progenies. Moreover, the result of oxygen consumption expanded when a progeny does larger amount of work on an everyday basis.

According to the article “Trends in the Nutritional Content of Television Food Advertisements Seen by Children in the United States (Analyses by Age, Food Categories, and Companies)” by Powell LM & Schermbeck RM et al.,⁹ the authors state that “children’s exposure to fast-food advertising has recently increased. The public health community and government agencies have emphasized the need to address unhealthful food advertising seen by children.”⁹ This means that youngsters who watch fast-food commercials have skyrocketed to new levels because of the amount of progenies who watch commercials. Moreover, bureaucratic companies highlights that fast-food commercials should be prohibited because of how progenies are observant and interested in eating those foods that are broadcasted on television. The author also makes a point that “television also remained the primary advertising channel for food and beverage companies, who spent an estimated \$745 million dollars in this medium, of which more than 50% was directed to children younger than 12 years.”⁹ In other words, liquid refreshment groups spent \$745 million dollars on advertising which is primarily drawn to youngsters younger than 12 years of age. Moreover, the liquid refreshment companies spent that much money on publicity knowing children will be baited by the advertisement. In my opinion, I think that it is a waste of money because that money can go into retirement plans, children’s future expenses and paying bills.

The author also states that “the largest percentage of reduction was for sweet ads, which fell by 55.1% and 44.0% among children aged 2 to 5 and 6 to 11 years, respectively.”⁹ This means that we are doing a good job condensing the sweet advertisements for children. The author also makes a point that “exposure to beverage ads fell more than 40% among both age groups, as did exposure to snack product

ads among younger children. Overall, exposure to food and beverage product advertising fell 32.5% and 21.7% among 2 to 5 and 6 to 11 year olds, respectively.”⁹ This means that the government agencies and the food and beverage companies are removing advertisement rapidly because youngsters are no longer being vulnerable to foods and beverages being displayed on the television.

In the article “Trends in Exposure to Television Food Advertisements Among Children and Adolescents in the United States” by Chaloupka FJ & Powell LM et al.,¹⁰ the authors state that “African American children in all age groups in all 3 years saw more food ads per day compared with white children.”¹⁰ This means that there is somehow racial discrimination that is taking place because of the amount of times food ads are appearing on television for African Americans. The author also makes a point that “white compared with African American youngsters had a substantially smaller increase in exposure (+0.7% vs. +5.2%).”¹⁰ In other words, race-related exposure expanded tremendously for African Americans than that of white progenies. The author also states that “trends showing a fall in exposure among 2 to 5 years olds but a rise in exposure among 6 to 11 year olds suggest that some companies may be shifting their advertising to programs that fall just under the threshold for their definition of children’s programming.”¹⁰ This means that food and beverage companies are deviating towards youngsters that are lagging behind, so that the food and beverage companies could understand the meaning for their interpretation behind youngsters television programming.

In the article “Amount of Hispanic Youth Exposure to Food and Beverage Advertising on Spanish-and English-Language Television” by Fleming Milici F & Hams JL et al.,¹¹ the authors state that “Hispanic children viewed 664 Spanish-language food ads, and adolescents viewed 769 Spanish-language food ads, which represent 15% and 17% of all food ads viewed, respectively.”¹¹ In other words, the amount or quantity of Hispanic youngsters principally demonstrate or indicate Hispanic progenies television observation. The author also makes a point that “exposure to large numbers of television advertisements for foods and beverages with little or no nutritional value likely contributes to poor diet among youth.”¹¹ This means that displaying TV set announcements for food and refreshments are partly accountable for inadequate weight-reduction. The author also states that “Hispanic preschoolers, children and adolescents viewed 4218, 4373, and 4542 total food and beverage ads on television, respectively, or 11.6 to 12.4 ads per day.”¹¹ This means that Hispanic youngsters have been exposed and have watched too much food and beverage advertisements on television. Moreover, one needs to do a better job to eradicate these advertisements on television.

According to the article “Reducing Racial/Ethnic Disparities in Childhood Obesity: The Role of Early Life Risk Factors” by Gillman MW & Kleinman KP et al.,¹² the authors state that “black-white differences in risk of overweight and obesity were reduced by 38% after adjustment for education and income partially explaining observed black-white differences.”¹² This means that African American to white ratio distinction has diminished very well by 38% after modification of education and income. The author also makes a point that “social conditions and their effects on children’s environments are important for partially understanding the origins of disparities in childhood obesity.”¹² In other words, societal circumstances and their impact or result on a progenies neighborhood is very vital when deciphering or comprehending the root of diverseness or divergence in childhood obesity.

According to the article “Childhood obesity: causes and consequences” by Bhadoria AS, Choudhury AK et al.,¹³ the authors state that “the psychological factors of childhood obesity are depression and anxiety, self-esteem, body dissatisfaction, eating disorder symptoms and emotional problems.”¹³ This means that youngsters who eat too much have to manage and handle problems with feelings and emotions, such as anxiety and stress, or battle tediousness. Their close relatives might have comparable preferences.

In the article “Psychological correlates of childhood obesity” by Munsch S et al.,¹⁴ the authors state that “An important psychological factor of childhood obesity might be found in familial stress.”¹⁴ This means that familial stress such as mental disorders might contribute to the manifestation and maintenance of childhood obesity, partly by promoting excessive energy intake.

The author also makes a point that “the mother’s anxiety predicted the child’s internalizing problems and the child’s self-reported depression and anxiety symptoms, whereas the mother’s depressive symptoms and eating-disorder pathology did not make an additional contribution.”¹⁴ In other words, the mothers concern or nervousness projected or anticipated the youngster’s inner difficulties and misery while the mothers gloomy warning signs and anorexia nervosa or bingeing did not mark or create a supplementary or extra improvement. The authors also state that “the causal relationship between obesity and psychological factors, such as impulsivity, depression, anxiety, familial influences and poor social functioning, is not clearly defined. This is further due to the cross-sectional nature of most studies, different definitions and assessment of psychopathology in childhood, as well as lack of inclusion of potential confounders or mediators (social parameters, TV viewing, sleep deprivation and so on).”¹⁴ In other words, the affiliation or association among obesity and psychological factors is not properly or appropriately clear. Furthermore, numerous or many meanings and valuation of mental disorders as well as the absence of societal limitations, small screen programing and sleep deficiencies are due to transversal analysis of most examinations.

The author also states that “the interrelatedness between weight gain and psychological problems might be bi-directional, in that clinically meaningful psychological distress might foster weight gain and rapid weight gain may lead to psychosocial problems.”¹⁴ This means that obesity and mental complications might be amalgamated in that mental and emotional pain and suffering might increase obesity while rapid obesity may indicate a correlation between the psychological and social aspect of an individual’s well-being or health which is a constant difficulty that needs to be examined.

Conclusion

In conclusion, childhood obesity is an illness that appears when a youngster is above the standard weight for his or her age group. Obesity in children functions as an important or crucial public health difficulty that affect’s youngster’s physical well-being, joy, and confidence. These articles made me think about all the in-depth information I never knew about childhood obesity. The general public base such as the media and television tends to control what and how one thinks. In order to eat healthy and live a long and flourishing life, one must refrain from

advertisement from the TV set that encourage and bait children to engage in unhealthy behavior. Children should participate in

exercising because exercise is a crucial part of a child’s life. When the youngster stays fit and trains its body, the child can live long. The incidence of childhood obesity must be monitored because if it is not observed, it will rise sharply to levels where one can’t control it anymore. The genetic factors of childhood obesity is the insulin gene that is near the INSIG 2 that is linked to childhood obesity. The psychological factors includes a child who overeats, and one has to manage and handle difficulties with feelings and emotions, such as anxiety and stress, or battle dullness. African American to white dissimilarity has weakened very well by 38% after adjustment of education and income. The public environment and their power on a child’s neighborhood is very important when interpreting and comprehending the root of inconsistencies of childhood obesity.^{15–20}

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Conflict of interest

Author declares no conflict of interest.

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