

Faktor Penyebab Kejadian Kelebihan Berat Badan dan Obesitas pada Anak-anak dan Dewasa

Factors that Cause Overweight and Obesity in School-Age Children and Adult

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ABSTRAK

Latar Belakang: Obesitas pada anak dapat mempengaruhi aktivitas dan motivasinya dalam belajar di sekolah. Obesitas juga dapat mempengaruhi kinerja orang dewasa dalam keterampilan dan produktivitas kerja mereka. Pencegahan dini kelebihan berat badan pada anak sangat penting dilakukan guna memaksimalkan kualitas hidup saat memasuki kelompok usia dewasa.

Tujuan: Tujuan dari penelitian ini adalah untuk mengidentifikasi faktor-faktor penyebab terjadinya kelebihan berat badan dan obesitas pada anak usia sekolah dan dewasa sehingga dapat dijadikan pedoman untuk mengatasi masalah kesehatan pada kelompok usia kritis tersebut.

Metode: Artikel ini disusun berdasarkan penelusuran literatur selama sepuluh tahun terakhir dan dilakukan melalui Google Scholar and Science Direct, terkait dengan faktor-faktor yang dapat menyebabkan kelebihan berat badan dan obesitas pada anak usia sekolah dan orang dewasa.

Ulasan: Hasil dari delapan belas literatur diketahui bahwa kebiasaan makan yang tidak sehat, lingkungan makanan, aktivitas fisik, faktor keturunan atau genetik, durasi tidur, dan pendapatan keluarga dapat menyebabkan kelebihan berat badan dan obesitas pada anak usia sekolah. Sedangkan jenis kelamin, tingkat pendidikan, faktor keturunan atau genetik, aktivitas fisik, asupan kalori harian, status perkawinan, pendapatan pribadi, dan kehidupan perkotaan merupakan penyebab kegemukan dan obesitas pada orang dewasa.

Kesimpulan: Faktor yang dapat menyebabkan kegemukan dan obesitas adalah jenis kelamin, tingkat pendidikan, kebiasaan makan yang tidak sehat, lingkungan makanan, aktivitas fisik, faktor keturunan atau genetik, lama tidur, pendapatan keluarga, asupan kalori harian, dan status perkawinan.

Kata kunci: berat badan berlebih dan obesitas, dewasa, faktor penyebab, usia sekolah

ABSTRACT

Background: Obesity in children can affect their activities and motivation in learning at school. Obesity can also affect adulthood performance in their work skills and productivity. Early prevention of overweight in children is very important in order to maximize the quality of life when entering the adult age group.

Objectives: The purpose of this study is to identify the factors causing the incidence of overweight and obesity in school-age children and adults so that it can be used as a guide to overcome health problems in those critical age group.

Methods: This article was compiled based on the literature search in the last ten years and was carried out through Google Scholar and Science Direct, related to factors that can cause overweight and obesity in school-age children and adults.

Discussion: The results from eighteen literature, it is known that unhealthy eating habits, food environment, physical activities, heredity or genetic factors, sleep duration, and family income can cause overweight and obesity in school-age children. While gender, level of education, heredity or genetic factors, physical activity, daily calorie intake, marital status, personal income, and urban living are the cause of overweight and obesity in adults.

Conclusions: Factors that can cause overweight and obesity are gender, level of education, unhealthy eating habits, food environment, physical activities, heredity or genetic factors, sleep duration, family income, daily calorie intake, and marital status.

Keywords: *adult, factors, overweight and obesity, school-age*

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INTRODUCTION

The prevalence of overweight or obesity all over the world including Indonesia have escalated throughout every year (Oroh, 2021; and Rachmi 2017). As for now, Indonesia is facing a double burden nutrition crisis which is undernutrition and overnutrition (overweight and obesity). Malnutrition (nutrition deficiency) and overnutrition is a nutritional problem in which often found in both developed and developing countries (Angesti, 2020). Overweight and obesity happened mostly because of the imbalance between energy intake and energy expenditure in a day for a certain long period of time, generally, it is associated with a person's eating habit. This imbalance of energy intake causes excessive fat accumulation in adipose tissues, it's certainly very dangerous because the accumulation of fat can increase the risk of a few health complications such as diabetes mellitus type 2, hypertension, dyslipidemia, obstructive sleep apnea, cardiovascular disease, and certain cancers. Overweight and obesity can become a serious health problem if not treated properly, not only it can cause a lot of health complications but also can lead to emotional and social problems. A person can be categorized as overweight if they have 10% to 20% more weight than their normal body weight. As for obese, a person is said to be obese if the excess weight reaches more than 20% of the normal weight (Septiani, 2017).

In Indonesia, based on the report of Riskesdas data by the Ministry of health of the Republic of Indonesia in 2013, the prevalence of overweight and obesity in children aged 5 to 12 years reached 18.8%. It is also reported by SIRKENAS in 2016, regarding obesity rates with BMI ≥ 27 increased to 20,7% while obesity with BMI ≥ 25 became 33,5% (Kemenkes, 2018).

Obesity in children can affects their activities and motivation in learning at school, and so that in the end it can affects learning achievement (Ulilalbab, 2017). Fulfillment of a child's daily nutrition needs is strongly dependent on the parents in the household. Children's activity level and eating pattern can also be greatly affected by their relationship with families in one household. If the family provides parenting patterns according to the child's developmental stage, it is expected that the fulfillment of child nutrition is achieved optimally (Nurbadriyah, 2018). As for adults getting older, there is a physiological change such as a decrease in muscle mass and revolution in several types of hormones that trigger an increase in total body fat which can lead to a fat accumulation in the abdomen (Puspitasari, 2018). As well as it can affect children's activities, obesity can also affect adulthood performance in their work skills and productivity.

This article reviews published data on the factors that cause overweight and obesity in children and adults. The purpose of this study is to identify the factors causing the incidence of overweight and obesity in school-age children and adults so that it can be used as a guide to overcome health problems in those critical age group. Identifying the factors that cause health problems obtained from being overweight or obese can help evaluate the existing nutritional program to be more effective and optimal in the future.

METHODE

The method used in this literature review is by two electronic databases for papers published in English and Indonesia language: Google Scholar and Science Direct, within the last ten years (2011-2021). The search in Google Scholar and Science Direct used the following key words: 1) overweight and obesity (overweight OR obese OR obesity), 2) factors (factor OR cause), 3) school-age (school-age OR children OR child), 4) adults (adult OR adulthood OR man OR women). Results will be combined from 1) to 4) with AND. The results obtained 18 articles that match the inclusion and exclusion criteria.

The following inclusion criteria were used in the selection of studies for this literature review: 1) research related to the factors that cause overweight and obesity in school-age children and adults in Indonesia 2) research articles (including observational studies namely cross-sectional, cohort, and case-control) 3) original and available in full text (not editorial, commentary, or abstract for conferences). Documents were excluded if they were: 1) not presented in either English or Indonesian. All articles found and chosen were then studied profoundly.

Total articles found are 225 then being identified for the title and abstract, there is 196 articles which were not included because they are not original or full text. The remaining 32 articles were then reviewed in full, there were 14 articles that did not meet the inclusion criteria. After being reviewed, there were 18 final articles that met the inclusion criteria.

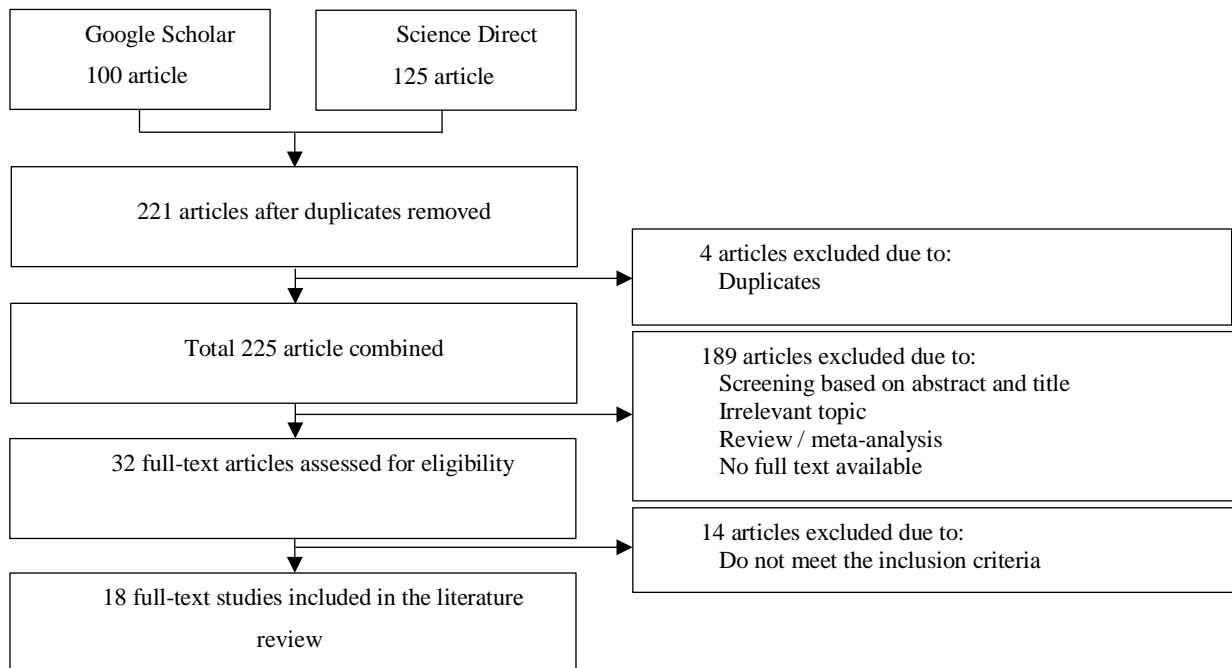


Figure 1. Diagram Flow of Included and Excluded Articles to Review

RESULT AND DISCUSSION

The main focus of this literature is to identify the causes of overweight and obesity in school-age children and adults. A total of 12 research studies results were included in the review and further explained in Tables 1 and 2. Eight articles were analysed for the factors of overweight and obesity in school-age, while five articles were analysed regarding factors that cause overweight and obesity in adulthood.

Factors that cause overweight and obesity in school-age children

Becoming obese earlier in life clearly amplifies certain health risks like hypertension, impaired glucose tolerance and type 2 diabetes, liver disease, and obstructive sleep apnea (Barbu, 2015). Obese children report a lower quality of life and demonstrate more negative self-perceptions, decreased self-worth, increased behavioural problems, and lower perceived cognitive ability (Ottova et al., 2012). Early prevention of childhood overweight is therefore very important but prevention strategy has to be supported by accurate epidemiologic data (Dehghan et al., 2005; Wang & Lobstein, 2006).

Unhealthy Eating Habits

Unhealthy eating habits such as irregular meals, high-energy food, a low intake of fruit and vegetables, and the frequent consumption of sugar-containing beverages have been associated with childhood overweight and obesity (Kristiansen, 2020). Obese children (69.4%) consumed the most fast food with a frequency of more than 2 times a week, while normal children (50.0%) consumed the most at a frequency of 1-2 times a week (Septiani & Raharjo, 2017). In accordance with Khomsan's (2006) statement, many fast foods contain high calories so that excessive consumption will cause obesity problems, but consumption 1-2 times a week may still be considered reasonable. The habit of consuming junk food or unhealthy snacks that contain ingredients such as artificial sweeteners, cooking oil that is used many times, and other flavoring ingredients is a snack that can be one of the causes of weight gain.

Some children stated that they often eat snacks at school because they don't eat breakfast at home, which makes them feel hungry at school (Rizona et al., 2020). Children prefer to consume modern fast food which can be categorized as junk food, because it contains more energy and less fiber (Damopolii, 2013). This is in line with the research of Kurdanti et al., entitled Factors that influence the incidence of obesity in adolescents, said that there is a relationship between not eating breakfast and the occurrence of obesity in adolescents.

Physical Activity

Physical activity can cause obesity due to the limited playing field and lack of facilities to play so that children prefer to play at home and the advancement of technology such as video games, playstation, television and computers which causes children to be lazy to do physical activity (Pratiwi & Hamdiyah, 2019). Children have been found to spend a lot of their time being sedentary, and a large part of this time is spent in front of a screen, including TV viewing. Sedentary behaviour has been associated with a higher BMI. The proxy measure of the presence of a TV in the child's bedroom has also been associated with childhood OWOB and to fat mass (Kristiansen, 2020). Lack of physical activity or known as a sedentary life style can result in unutilized energy stored, it can lead to the metabolic process does not function optimally which results in the accumulation of energy reserves. Over time it will become fat deposits and there is an uncontrolled weight gain (Rizona et al., 2020). A pattern of less activity causes the number of calories to be burned less than the calories obtained from the food consumed, thus potentially causing excess fat accumulation in the body. Upaya meningkatkan aktivitas fisik sejak anak- anak termasuk usia saat pra sekolah, akan dapat menjaga agar anak-anak tetap memiliki aktivitas fisik yang cukup dalam upaya pencegahan obesitas (Zamrani et al., 2016).

Hereditary or Genetics

Parental obesity has been shown to be a strong predictor of childhood OWOB, children with parental obesity are more than twice as likely to have overweight or obesity. Parental obesity could have an effect both through environmental factors and genetics (Kristiansen, 2020). Wirakusumah (2004) states that if there is a hereditary factor in obesity, then there is a tendency for a person to build more fat than others because there are inherited metabolic traits, for example there is an innate gene in the code for the more active Adipose Tissue Lipoprotein Lipase enzyme. Mechanisms of genetic susceptibility to obesity through effects on resting metabolic rate, non-exercise thermogenesis, rate of lipid oxidation and poor appetite control. This susceptibility to obesity is determined genetically while the environment determines the expression of the phenotype (Permatasari etl al., 2013).

Sleep Duration

Obese children have shorter sleep duration than non-obese children. The average sleep duration of obese children is 16.1 minutes/day shorter than that of non-obese children. Based on the National Sleep Foundation and research in Australia, children of elementary school age normally have 10 hours of sleep per day. Cohort studies explain that children who have short sleep durations can lead to a high sedentary lifestyle and increased energy intake, resulting in obesity in children. 5. Short sleep duration can increase hunger, increase the opportunity to eat, thermoregulation changes occur, and increase fatigue. Increased energy intake that is not matched by energy expenditure can cause obesity. Increased food intake, especially high-fat and high-carbohydrate foods. These changes are associated with an increase in serum ghrelin and a decrease in serum leptin. Lack of sleep (2-4 hours a day) can result in a loss of 18% of leptin and an increase of 28% of ghrelin which can cause an increase in appetite of approximately 23-24%. Then it can be concluded from several studies that overall, reduced sleep can increase excessive intake by >250 kcal/day (Marduah et al., 2013).

Family Income

Certain population groups with greater access to high-energy diets (low-socioeconomic status in industrialized countries and high-socioeconomic status in developing countries) have an increased risk of being obese than their counterparts. A higher prevalence of obesity was also reported in rural areas associated with lower incomes (Barbu, 2015). In high-income countries obesity is now more prevalent in persons with a low economic status, parental education has been shown to be a robust measure of socioeconomic position (Kristiansen, 2020). Due to its relatively higher price compared to traditional food, Western fast food consumption is more common for children from high economic status families. In addition, at present Western fast food restaurants are still mainly located in urban areas. As previously stated, parental education is related to parents' income level. Family income that supports the ability to buy fast food is what causes the increase in consumption of high-energy foods (Parengkuan et al., 2013).

Tabel 1. Factors of Overweight and Oesity in School-Age Children

Research Title and Author	Subjects	Method	Result
Pola konsumsi fast food , aktivitas fisik dan faktor keturunan terhadap kejadian obesitas (studi kasus pada siswa SD Negeri 01 Tonkong Kecamatan Tonjong	72 elementary children (36 overweight & 36 normal students)	Cross-sectional	A significant relationship between fast food consumption patterns (p<0.05), physical activity (p<0.05) and hereditary history (p<0.05) with obesity in children.

Kabupaten Brebes) (Septiani, 2017) Distribusi karakteristik faktor penyebab obesitas pada siswa sekolah dasar (Rizona et al., 2020)	40 obese students	Explanatory study	The majority of obese children often consume junk food (72.5%), skip breakfast (65%), severe physical activity (82.5%), went to school with a vehicle (70%) and sleep duration less than 7 hours (72.5%).
Analisa riwayat orang tua sebagai faktor resiko obesitas pada anak SD di Kota Manado (Permatasari et al., 2013)	136 students grade 1-5 Case : 68 obese Control : 68 non-obese	Cross-sectional	There is a corelation between parental obese history (obese in father OR=1.1; obese in mother OR=2.5) with obesity in children.
Hubungan pendapatan keluarga dengan kejadian obesitas pada anak sekolah dasar dikota manado (Parengkuan et al., 2013)	136 students grade 1-5 Case : 68 obese Control : 68 non-obese	Case-control	Family income contribute to the incidence of obesity in children. Case group (obesity students) are in the high family category (OR=3.8).
Durasi dan kualitas tidur hubungannya dengan obesitas pada anak sekolah dasar di Kota Yogyakarta dan Kabupaten Bantul (Marfuah et al., 2013)	488 elementary students Case : 244 obese Control : 244 non-obese	Case-control	There was a significant relationship between low quality of sleep (OR=1.88) and obesity.
Hubungan konsumsi fastfood dengan kejadian obesitas pada anak sd di kota manado (Damopolii, 2013)	136 students grade 1-5 Case : 68 obese Control : 68 non-obese	Cross-sectional	There is a corelation between fast food consumption (p=0,024) with the incidence of obesity in school-age children.
Aktivitas fisik berhubungan dengan kejadian obesitas pada anak sekolah dasar (Zamzani et al., 2016)	96 elementary students grade 3 , 4, 5	Cross-sectional	Physical activity (p=0.009) had a significant relationship with the incidence of obesity in children.
Risk Factors of Obesity in Children 5-15 Years Old (Sartika R.A.D., 2011)	170.699 school-age students	Cross-sectional	Hereditary/family hirtory (p=0.000), physical activity (p=0.035), Eating Habits (p=0.000)

Factors that cause overweight and obesity in adult

According to research conducted by Kusteviani in 2015, the prevalence of obesity was higher at the age of 55-64 years. This is presumably because with age, the accumulation of fat also increases. Fat accumulation occurs due to changes in certain types of hormones and a decrease in muscle mass at an older age. In addition, at the age of 40-59 years, obesity is caused by slow metabolism, lack of physical activity and more frequent food consumption.

Tabel 2. Factors of Overweight and Oesity in School-Age Children

Research Title and Author	Subjects	Method	Result
Pola konsumsi fast food , aktivitas fisik dan faktor keturunan terhadap kejadian obesitas (studi kasus pada siswa SD Negeri 01 Tonkong Kecamatan Tonjong Kabupaten Brebes) (Septiani, 2017)	72 elementary children (36 overweight & overweight students, 36 normal students)	Cross-sectional	A significant relationship between fast food consumption patterns (p<0.05), physical activity (p<0.05) and hereditary history (p<0.05) with obesity in children.
Distribusi karakteristik faktor penyebab obesitas pada siswa sekolah dasar (Rizona et al., 2020)	40 obese students	Explanatory study	The majority of obese children often consume junk food (72.5%), skip breakfast (65%), severe physical activity (82.5%), went to school with a vehicle (70%) and sleep duration less than 7 hours (72.5%).
Analisa riwayat orang tua sebagai faktor resiko obesitas pada anak SD di Kota Manado	136 students grade 1-5 Case : 68 obese	Cross-sectional	There is a corelation between parental obese history (obese in father OR=1.1; obese in mother OR=2.5)

(Permatasari et al., 2013)	Control : 68 non-obese		with obesity in children.
Hubungan pendapatan keluarga dengan kejadian obesitas pada anak sekolah dasar dikota manado	136 students grade 1-5 Case : 68 obese Control : 68 non-obese	Case-control	Family income contribute to the incidence of obesity in children. Case group (obesity students) are in the high family category (OR=3.8).
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(Damopolii, 2013)	96 elementary students grade 3 , 4, 5	Cross-sectional	Physical activity (p=0.009) had a significant relationship with the incidence of obesity in children.
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(Zamzani et al., 2016)	170.699 school-age students	Cross-sectional	Hereditary/family hirtory (p=0.000), physical activity (p=0.035), Eating Habits (p=0.000)
Risk Factors of Obesity in Children 5-15 Years Old (Sartika R.A.D., 2011)			

Gender

Based on Permatasari's research (2018), women naturally have more body fat reserves, especially in the abdominal area compared to men. Women tend to be more at risk of obesity, especially at the time after menopause. Postmenopausal women have a high percentage of belly fat, total cholesterol, and triglycerides. Women at the time of menopause experience a decrease in muscle mass and changes in hormone status such as estrogen. In addition, it is supported by reduced physical activity and excessive energy intake (Kusteviani, 2015).

Level of Education

The level of education affects food consumption through the selection of food ingredients. People with higher levels of education tend to choose foods that are good for their bodies compared to people with lower levels of education (Permatasari, 2018). Education is related to the mindset and level of knowledge that can lead to behavior change. The higher the education level, the easier it is to receive knowledge and information through other people and the mass media. The knowledge obtained can be used as a good guideline in everyday life, especially knowledge about balanced nutrition and health so that it can assist in choosing good food in terms of quality and quantity. In addition, it can increase awareness in maintaining a healthy body and ideal weight so as to reduce the possibility of obesity (Kusteviani, 2015). According to Diana et al (2013), 2. Someone with a higher level of education will be better at receiving, processing, interpreting, and using information, especially nutritional knowledge. Subjects with higher education will have higher nutritional knowledge because they have more experience and access to information so that they can have better nutritional attitudes and practices, especially in terms of food consumption behavior and physical activity which are closely related to obesity. Someone with a low level of knowledge will usually often choose foods that are just full without understanding the balanced nutritional intake needed by the body. So that too many carbohydrates are consumed in one serving of food. Someone who has good knowledge about obesity, still performs unhealthy behaviors such as a sedentary lifestyle and eating excessive amounts when experiencing stress. Knowledge is basically a part of behavior, but it does not guarantee that people who have good knowledge also have good behavior. Because a person's behavior is also influenced by other factors.

Hereditary or Genetics

Genetics or heredity has a positive effect on obesity and body fat distribution, the genes inherited in each individual determine the metabolic rate and energy use (Triyanti & Ardila, 2019). Respondents in Puspitasari's research (2018) found that those with a history of heredity were at 1.5 times greater risk of developing obesity compared to respondents who had no hereditary history. Besides controlling body fat mass and the role of genes in the emergence of traits related to obesity, it reaches 50% or more. The mechanism of obesity which is a genetic factor is in terms of controlling adipogenesis. If a person comes from a family with central obesity, then

that person is 2-8 times more likely to have central obesity than coming from a non-obese family (WHO, 2013).

Physical Activity

Regular physical activity or exercise can lead to a considerable decrease in fat tissue, this is because exercise can increase fat-free tissue mass. Lack of physical activity can cause food substances that enter the body are not burned, but only stored in the body as body fat (Puspitasari, 2018). The results of Suryadinata & Sukarno's research (2019) showed that the obese group had lower physical activity than the non-obese group. This is because most people with obesity often spend time with light activities or sedentary life. The same results were obtained in a study conducted by Diana et al (2013) that subjects who had light physical activity had a higher risk of obesity than subjects who had heavy physical activity. Strenuous physical activity can prevent the increase in fat accumulation with age. The advantage of doing physical activity is that it can increase energy expenditure, suppress appetite, regulate eating patterns and lose muscle mass in the body (Kusteviani, 2015).

Calorie Intake Daily

Calories or energy are the result of the metabolism of carbohydrates, fats and proteins. Excess energy is stored for energy reserves in the form of glycogen as short-term reserves and in the form of fat as long-term reserves. Excess food intake can cause obesity, especially food sources of energy, where the amount of food eaten far exceeds the normal body needs. Increasing the amount of energy intake above the recommended nutritional adequacy rate affects the development of obesity. People with energy intake are 1.7 times more likely to be obese than those who have adequate energy intake (Puspitasari, 2018). The results of Triyanti & Ardila's research (2019) show that women with excess carbohydrate intake have a 4 times risk of developing central obesity compared to women with no more carbohydrate intake, so women with excess energy intake have a 2,922 times risk of central obesity compared to women with low intakes.

Consumption of sugar-sweetened beverages, especially carbonated soft drinks, may be a risk factor for the obesity epidemic through their high sugar content, low satiety and contribution to total energy (Malik et al., 2006). The high consumption of foods and beverages that contain high energy density such as high fat, sugar and starch will increase total energy intake (WHO, 2003). In addition to increasing the risk of obesity, high carbohydrate consumption also increases the risk of metabolic syndrome in women with BMI ≥ 25 (Kim et al. 2008). 1. Excessive consumption of carbohydrates including soft drinks, high-fructose foods and other sweet foods is associated with obesity (Tchernof & Depres, 2013). 3. Increased consumption of HFCS (High Fructose Corn Syrup) which is used in sweet energy drinks (soft drinks) contributes to an increase in total energy and contributes to the obesity epidemic. In addition, sweet foods contribute to an increase in total energy or high energy density and the effect of the delicious taste of sweet foods and the effect of weak feeling of satiety (Kusteviani, 2015).

The results of a 7-year cohort study show that people who eat food sources of animal protein are at risk of developing obesity by 4.62 times. This is presumably because food sources of animal protein are also foods that are high in fat (Bujnowski et al. 2011) and high fat intake is associated with the risk of obesity (Philips et al. 2012). In addition, fatty foods have a high level of energy density so that it can allow a positive energy balance to occur if consumed in excessive amounts (Triyanti & Ardila, 2019). Fat intake has a higher energy density than other macronutrients, namely every one gram of fat contains 9 kilocalories. The role of consumption of fatty foods on increasing body fat as a result of high energy density, delicious taste of fatty foods, high metabolic efficiency, weak power of satiety, and weak physiological regulation of fat intake on carbohydrate intake (Kusteviani, 2015).

Marital Status

Research by Puspitasari (2018) explains that respondents who marry after marriage will tend to adjust to their partners both in terms of lifestyle and food patterns. Adjusting to a bad partner results in a person's stress. This condition of stress or depression can lead to an unhealthy lifestyle such as the consumption of alcoholic beverages and the consumption of high-fat foods. A person who is depressed tends to consume excessive amounts of food. Based on research by Diana et al. (2013), married women are almost 3 times more likely to be overweight than unmarried or unmarried women. Also, weight gain during pregnancy increases fat stores. The fatter reserves, the longer the weight loss occurs.

Pregnancy causes hormonal changes that have an impact on the weight gain of visceral fat and postpartum fat tissue (Triyanti & Ardila, 2019). The highest prevalence of abdominal obesity is in divorced status and the lowest is in unmarried status (Kusteviani, 2015). The high prevalence of abdominal obesity in divorced status is thought to be due to depression experienced by a person when divorced, causing unhealthy lifestyle changes such as consuming alcoholic beverages and high-fat foods. The food consumed will be excessive when experiencing depression.

Personal Income

Research by Diana et al. (2013) found that individuals with upper-middle income were at 1.566 times greater risk of being overweight than subjects with lower-middle income. Subjects with obese nutritional status use their income more for food expenditure, especially meat and dairy products, but spend less on traditional food (Roemling & Qaim 2012).

Urban Living

In theory, urban or urban areas have a higher risk of central obesity because foods high in fat and sugar are more varied and in abundance (Triyanti & Ardila, 2019). The area of residence is a risk factor for obesity where subjects who live in urban areas have a risk of 1,358 times greater being obese. The urban environment, such as access to food and transportation facilities, is thought to support a lifestyle that leads to obesity, such as easy access to fast food and transportation facilities that can reduce levels of physical activity (Diana et al., 2013).

CONCLUSION

Factors that cause overweight and obesity in school-age children are unhealthy eating habits (such as high consumption of fast food, junk food and not having a breakfast), food environment (which is related to urbanization), physical activities (screen time and daily activities), heredity or genetic factors, sleep duration (lack of sleep), and family income (related to parents education level). While overweight and obesity factors in adults are gender, level of education, heredity or genetic factors, physical activity, daily calorie intake (especially from carbohydrate, fat and sugary drinks intake), marital status, personal income (high income), and urban living.

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