THE INCREASE OF ADDED SUGAR CONSUMPTION AND OBESITY AMONG THE ADOLESCENT[1]

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Abstract: *Worldwide the consumption of sugar has rapidly increased and nowadays it reaches to amounts repeatedly exceeding the permissible daily doses. The World Health Organization, as well as a number of American, European healthcare institutions and non-governmental organizations, are taking numerous measures at global level to reduce the added value of sugar in foods and increase public awareness of its harmful health impacts.*

In this scientific report, a study of eating habits was conducted among 78 students on the age of 12 to 15y.o. from the city of Rousse. The questionnaire includes questions about the amount of sugar consumed daily, the level of awareness of recommended standards, consumption of pasta and non-alcoholic beverages. The summarized results eloquently speak of a low level of awareness of the daily recommended consumption standards for added sugar. Most children experience daily consumption of pasta and confectionery, as well as carbonated beverages.

Keywords*: added sugar, recommended standards, health, harmful impact, awareness, study of children.*

INTRODUCTION

Globally, the number of overweight people or people with obesity has increased dramatically and is reaching epidemic proportions. Excessive consumption of sugar is one of the factors that lead to being overweight and obesity. Today, sugar is widely available and inexpensive. Over the past decade, global sugar consumption has reached 130 to 178 million tonnes per year, and is expected to reach 182 tonnes. In the March 2015 World Health Organization (WHO) Sugar Control Guide (WHO), it is recommended that adults and children limit the intake of sugar to less than 10% of the total energy intake per day, equivalent to about 12, 5 teaspoons of sugar and offers further reduction to less than 5% or about 6 teaspoons of total energy intake per day. Global consumption exceeds the WHO guidelines for sugar. Sugar consumption is rising, especially in low- and middle-income countries (WCRF, 2015). A number of studies have shown that sugar intake varies depending on race and income. Generally, adolescents and young people, black people, low-income people, and men consume the most added sugar (Bowman SA, Clemens JC, Martin CL, et al., 2017). A little over 100 years ago, Britain was the center of the sugar empire and there were 100 small refineries. In the 20s of the 20th century beet production increased, with 20 beet processing factories being built over this decade. Over the years, sugar consumption has grown, with an increase in sugar consumption per capita reaching 35 kg. During the First and Second World Wars there was a drastic reduction in sugar consumption. A study has been

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conducted on the average consumption of sugar from 1700 to the present day. The results are presented in table. 1.

Table 1. Consumption of Sugar through the years

Year	Consumed sugar in gr per day	Consumed sugar yearly
1700 y	4.9 gr	1,81 kg
1800 y	22,4 gr	10,2 kg
1900 y	112 gr	40,8 kg
2009 y	227 gr	81,6 kg

The results clearly show that consumption has increased many times. Now the average person consumes 70 grams of fructose each day, which is shockingly high (300%) above the daily recommended amount (Bespok, 2016). Added sugars in processed foods are a major driver of the obesity epidemic and have direct metabolic effects that increase the risk of type 2 diabetes, hypertension, and heart and liver disease. They lead to increased dental disease. Added sugars are sugars and syrups that are added to foods or beverages in the process of processing or preparing. They do not include naturally occurring sugars like those in milk and fruit. Sugar is added to three of the four products in the grocery, making it almost impossible to avoid it. It has been shown that an average American consumes about 17 teaspoons of added sugars a day, which is about 50% more than recommended by the Dietary Guidelines for Americans (DGA) and the WHO. The United States is the world's leading consumer of added sugars and ranks third in the world in sales of sweet drinks. All of this leads to the consequences of excessive consumption of sugar - the United States is one of the countries with the highest relative share of the world 's overall obesity rate, and the highest share of obesity among children. More than 30 million Americans suffer from diabetes, and another 84 million are at risk of developing type 2 diabetes. Dietary guidelines for Americans 2015-2020 recommend restricting added sugars to less than 10% of daily calories - about 12 tablespoons added sugars a day. The American Heart Association even sets a lower limit and makes recommendations based on age and gender.

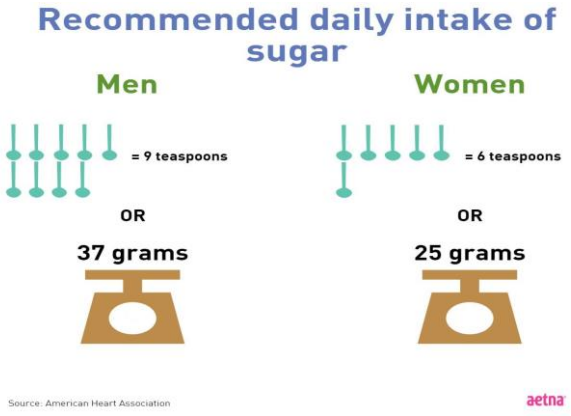

Figure 1. The Recommended daily sugar intake dose

Over the past two centuries, US sugar consumption has increased sharply and steadily. Increased consumption of sugar corresponds to higher levels of obesity and diabetes. Sugar consumption has increased significantly since 1980 when the obesity epidemic began. Sugar consumption reached its peak in 1999 with about 425 calories a day, and then began to decline. On average, Americans of all ages consume more added sugar than recommended by the American Heart Association, the Dietary Guidelines for Americans for 2015 and the World Health Organization (NFA 2019).

The added sugar is contained in 74% of the packed food. The American Food and Drug Administration (FDA) requires food manufacturers to list all ingredients on labels. Added sugar

exists in many forms - that's why it's so hard to find on the label. There are at least 61 different sugar names listed on the food labels. These include common names such as sucrose and high fructose corn syrup, as well as barley malt, dextrose, maltose and rice syrup. Product labels contain a total sugar content, manufacturers are not required to indicate the added sugar, which makes it difficult to understand how much of the sugar is added sugar and how much is the natural sugar (Sigman-Grant, M., Morita, J., 2003; AFDA, 2004).

With daily food that is considered "commonly accepted" like carbonated beverages, sweetened teas, "low-fat foods", different types of "healthy" foods, chocolate and sugar products, frighteningly high amounts of sugar are taken. The US Department of Agriculture website (USDA) is a National Nutrient Database of the best-selling and consumed foods and beverages. The tables indicate the respective portions in ml or grams and the contents of the quantities of sugar, measured in teaspoons, of soft drinks, chocolate and sugar products, fruits, vegetables and other most commonly consumed foods.

Table 2. Shows samples of the tables for soft drinks, confectionery and fruit.

Drink	**Portion**	**Tee spoons sugar in a portion**	**Sweets**	**Portion**	**Tee spoons sigar in a portion**	**Fruits**	**Protion**	**Tee spoons sugar in a portion**
Apple Juice	Glass 248ml	6.0	**Bounty**	Bar 45g	5.2	**Aplle**	1 medium	4.7
Carrot juice	Glass 236ml	2.3	**Chocolate**	Bar 45g	6.4	**Apricot**	1 medium	0.8
Coca Cola	Bottle 2l	53.8	**Chocolates**	10pieces./ 30g	4.7	**Dried apricots**	130 g	17.4
			Chocolate Raisins	180g	28	**Banana**	1 medium	3.6
Nestea	368ml	8.4	**Jelly Beans**	10pieces/ 11g	1.9	**Avocado**	136 gm	0.1
Orange juice	Bottle 248ml	5.2	**Frozen Yogurt**	174g	8.7	**Blackberries**	144 g	1.8
Fanta	372 ml	11.4	**Twix**	Bar 55g	6.4	**Fig**	50 g	2.0
Red Bull	258 ml	6.5	**Vanilla Ice Cream**	5.3g	3.5	**Grape**	10 grapes/ 49	1.9
Grape juice	372 ml	10.4	**Kit Kat**	Bar 45g	5.8	**Cantaloupe**	1 medium 1280 gm	26
Cranberry juice	Glass 253 ml	7.5	**Magnum Ice Cream**	77g	5.5	**Raspberries**	10 pieces.	0.2
			Bar Mars	53g	7.7	**Strawberries**	144 g	1.8

			Snickers	50g	6.1	**Tangerine**	88 g	2.3
						Pineapple	905 g	22.3

Other interesting data in a box (245g) low-fat yoghurt, sugar can reach up to 47g. or 12 teaspoons, the barbecue sauce contains 14 grams of sugar (2 cc). This is a small portion of the food consumed by every person almost every day.

There is a wide range of policies to reduce the availability and accecibility of sugar and sugar products as well as to raise public awareness.

Healthy Food America offers six key policies and actions to reduce the amount of US sugar consumed:

1. Reduction of added sugars in food and beverages. Added sugar is present in 68% of all processed foods. It takes a lot of effort to reduce sugar if you need to know how much sugar there is in a product, to determine how much of the maximum daily intake it is, and to monitor the consumption of sugar in all foods that are taken for the day. Conversion of products with less added sugar is achieved by limiting the added sugar and reducing the portion size.

2. Increase the price of sweet products for production or purchase by imposing a tax or a tax on sweet drinks and / or other high sugar products.

3. Reduce the availability of sweet products. Over the last few decades, sweet drinks and snacks have become almost inevitable, they are available in schools, hospitals, kindergartens, gas stations, government buildings, recreation centers and many other places. Measures in this direction are removing the sweet products and drinks from schools, hospitals and other healthcare facilities.

4. Improve the labeling and packaging of sweet products by indicating the unhealthy amounts of added sugar of each product and a health warning label on the packaging.

5. Restrict advertising and promotion of sweet products by restricting the advertising of children, advertisements and promotions on the spot.

6. Educational campaigns and healthy nutrition advertising through the launch of initiatives to raise public awareness and combat advertising for sweet products (HFA, 2019)

According to a prospective study, compliance with product labeling standards will result in a reduction in added sugar of between 7.5% and 9% in food products, with significant health benefits of preventing twice as many cases of cardiovascular disease and diabetes (Wetsman N., 2015).

The International Diabetes Federation (IDF) identifies government measures taken by the EU member states. At national level, a number of countries have introduced taxes to reduce the consumption of sugar and sweetened beverages: In Finland, non-alcoholic beverages are being taxed since the 1940 and taxes increased in 2011. Norwegian tax has been levied on refined sugar products, including soft drinks. In 2011, Hungary increased the tax on a number of products, including soft drinks, energy drinks, pre-packed sweetened products, salty snacks and spices. In France, a tax on sugar and sweetened beverages was introduced in 2012. In 2016, the UK Treasury Department announced that a tax was levied on added sugars, and the revenue generated from this tax would be used to fund physical activity training in Primary Schools and Sports (IDF, 2016).

EXPOSITION

In order to determine the eating habits of adolescents in March 2019, a survey was conducted among 78 children aged between 12 and 15 years. The participants are 26 pupils from 6th, 7th and 8th grade in SUEE "St. Constantine-Cyril Philosopher", Rousse. The questionnaire contains 11 questions, of which 9 closed-ended and 2 open-ended, aimed at informing about daily intake of fruits and vegetables, pasta, confectionery, water and non-alcoholic beverages. Students were also surveyed about their level of awareness of the harmful effects of white sugar and the daily

allowable rate of sugar intake. In one of the open-ended questions, they describe their daily menu. The last question from the poll gives an account of the gender of the participants.

The results according to white sugar consumption show that more than 70% (55n) of pupils are unaware of the daily intake of sugar, 50% (13n) of the children between 12 and 13 years of age consume each day pasta (bread, pizza, spaghetti, snacks) and the rest (50%) 2-3 times a week. Among the slightly older ones, between the ages of 14 and 15, the relative share is increased to 75%, or 20 of the 26 children consume pasta every day. Among the oldest students (8th grade), the relative share is 35% (9n), there is a decrease in the daily consumption of pasta, even some of them responding that they do not consume them at all. Conversely, is the issue of confectionery, where the peak is observed among 13-14 year olds, with 66% (17n) consuming sugar products (chocolate, wafers, biscuits, candy, cake, ice cream) every day and only 30% limit their intake to 2-3 times a week. Among the oldest students, the intake is also increased and 50% (13n) of the students respond that they consume confectionery every day and 38% (8n) to 2-3 times a week, the youngest (6th grade) are reversed - 38% (8n) consume regularly and 50% (13n) up to 2-3 times a week. Children's responses to drinking preferences by age are reflected as follows in Figure 2, 3, and 4.

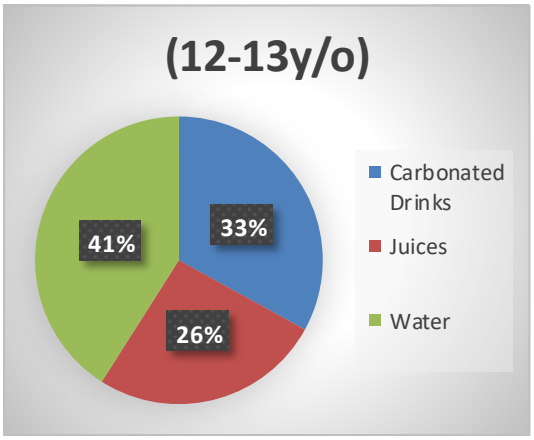

Figure 2. Preferred intake of liquids among the 6th graders

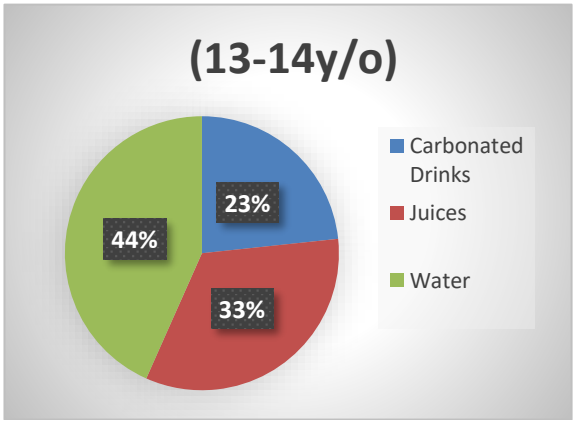

Figure 3. Preferred intake of liquids among the 7th graders

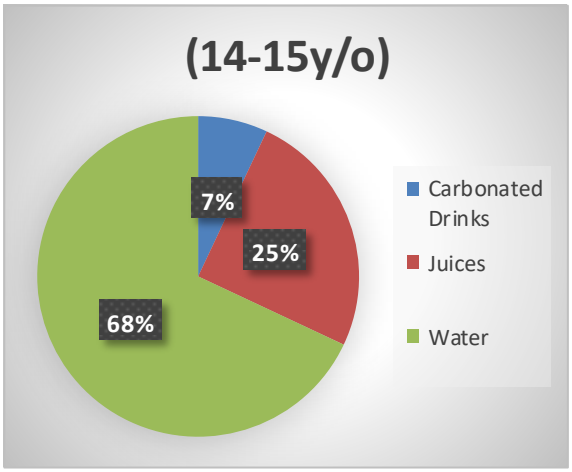

Figure 4. Preferred intake of liquids among the 8th graders

From the data obtained we conclude that with age the number of children who consume carbonated beverages and juices is decreasing at the expense of the number of children who prefer mineral water. Most participants rated the fizzy beverages as preferred in a daily intake of 2-3 cups, and those who scored natural juices with 2-3 cups of juice or 1 bottle.

In a bottle of natural juice (250ml) there are about 27g of sugar and in a glass of Coca Cola (200ml) more than 20g of sugar, with a recommended daily intake of sugar for children over 11 years of 30g of sugar daily, only with the choice of inappropriate drink the consumption of sugar is greatly increased.

For the intake of sugar in school, the answers are not so positive. The smallest participants (12-13) show a high consumption of fast foods (30%) and confectionery (18%) at the expense of home-cooked meals (23%), yogurt (16%) and fruit (10%).

In seventh grade (13-14 years), the intake of fast foods is the highest (39%), as well as confectionery (23%), home-made food (20.5%), yoghurt (7%) and fruit (10%).

The oldest participants in the survey (14-15 years) have the highest intake of fruits (27%) and pre-cooked food (30%), reduced intake of sugar products (7%) and yogurt (6%). , but the fast food remains a constant (30%).

CONCLUSIONS

From the studied sources of information and analysis of the results of the survey, the following conclusions were drawn:

• Worldwide, the consumption of added sugar significantly exceeds the recommended doses.

• Measures have been taken to reduce added sugar in food and beverages available on the market, by changing labeling, taxing, changing the advertising policy and raising awareness.

• The awareness of the population about the presence of added sugar and the quantities in each product would reduce the consumption of large quantities of products in which it is contained.

By examining the eating habits of adolescents, we can conclude that children aged 12 to 14 years experience an increased intake of pasta and confectionery, as well as carbonated beverages, which lead to a rapid increase in body weight and therefore to an overweight weight and obesity. Soothingly, participants in the 14 to 15 years report a decline in the consumption of all foods and beverages containing a huge amount of sugar.

Although today children have access to a variety of sources of information, they need a targeted awareness of the harmful impact of sugar, the world and European norms on acceptable daily intakes of sugar and ways of controlling the amounts of added sugar.

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