

Sugar and Cooking Oil Consumption in Surabaya

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ABSTRACT

The consumption patterns of urban communities has been shifted and leading to fast foods. Fast foods contained high sugar and fat so they tasted delicious and became favorite for many people. Excessive consumption of sugar and fat might lead to overweight and obesity, which increased the risk of coronary heart disease (CHD), diabetes, and stroke. This study aimed to describe the consumption of sugar and cooking oil in Surabaya. This study used cross-sectional survey. The data were obtained from interviews using Semi Quantitative Food Frequency Questionnaire (SQ FFQ) form with 428 research participants. The results showed that the sugar consumption of Surabaya residents was 28.81 g and the cooking oil consumption was 38.43 g/cap/day. These numbers were categorized within safe limits according to the government recommendations.

Keywords: *Cooking Oil, Sugar, Obesity, Hypertension, Metabolic Syndrome*

1. INTRODUCTION

The consumption patterns of urban communities are increasingly shifting. Fast food becomes the centre of interest and is easily available and favoured by various age groups. These foods tend to have high sugar and fat so they mostly have a delicious taste. Indonesia has been at a very high risk for sugar and fat/oil consumption. 30% of the total population consume sugar and fat/oil more than the suggested amount per serving per day [1]. The sources of sugar and oil are not only from processed and ready-to-eat food, but also home-cooked and snack foods [2]. Some ready-to-eat foods are best known as frozen food, of which it must be fried before being consumed such as nuggets, sausages, donuts, *cireng*, tempura, and French-fries. Such typical foods might increase the consumption of cooking oil.

Excessive consumption of sugar and fat might lead to overweight and obesity. Based on the results of the 2018 Basic Health Research (Riskesmas), there was an increase in the case of obesity in East Java Province from 8.4 in 2013 to 22.37 in 2018, of which this number was even higher than the national obesity case in 2018 of 21.8 [3, 4]. The increased obesity case can increase the risk of coronary heart disease (CHD), diabetes, and stroke [5].

Home-cooked food scale plays an important role in family consumption, especially in relation to sugar and cooking oil consumption. The present study aimed to

describe the consumption of sugar and cooking oil in Surabaya, Indonesia.

2. METHOD

This study used descriptive cross-sectional research design. The data were obtained from interviews using Semi Quantitative Food Frequency Questionnaire (SQ FFQ) form. The food consumption survey was carried out before the Covid-19 pandemic. This study was limited to sugar and cooking oil consumption, regardless sugar (e.g. brown sugar, sweetened packaged drinks, and honey) and cooking oil (e.g. margarine, butter, and canola oil) types such as that were extraneous to the present study focus.

The population of this study were all Surabaya residents totaled 3,158,943 people in 2019 [6]. The sample was calculated using Slovin formula by determining the margin of error of 5%, so that the minimum number of samples was 400 people. In anticipation of a drop out due to errors or irregularities during data collection, the number of the sample was added 10% of the total samples, which was 40 additional samples. During the data collection, 432 samples were collected and four samples were dropped out, so that the final total samples were 428 participants. Then, these samples were categorized based on five areas of Surabaya. Table 1 shows the sample distribution based on the five Surabaya areas.

Table 1. Sample Distribution based on five areas in Surabaya

Areas	Samples
North Surabaya	106
East Surabaya	72
Center of Surabaya	72
West Surabaya	71
South Surabaya	107
Total Samples	428

3. RESULTS AND DISCUSSION

3.1. Sugar Consumption

Sugar consumption did not only refer to granulated sugar but also include brown sugar, jam, candy, syrup, chocolate, jelly, gelatin, honey, and also sweeteners [6]. However, sugar types were not the focus of the present study.

Based on the research conducted, the average sugar consumption of Surabaya people was 28.81 g/cap/day. Figure 1 shows Surabaya people’s sugar consumption per capita per day based on the Surabaya area. The amount of sugar consumption exceeded the national average sugar consumption in 2018, which was 20.9 g [7]. Although this amount exceeded the national average sugar consumption, it was still below the government's suggested amount of serving based on Permenkes Number 30 Year 2013 [8], that the maximum sugar consumption was 50 g to avoid obesity, diabetes, and other diseases. Meanwhile, WHO recommended that sugar consumption per day was less than 10 percent of the total energy intake, or approximately 25 g for health purposes [9].

However, the finding of the present study was only for granulated sugar, not other sugar types such as syrup, brown sugar, and packaged sweet drinks. So that, the total amount of sugar consumption could be very likely to be higher. This must be in consideration as the increasing consumption of sugar-sweetened beverages caused weight gain and increased the risk of overweight and obesity [10].

Long-term consumption of added sugars and sugar-sweetened beverages is associated with higher pericardial adipose tissue, visceral adipose tissue, and subcutaneous adipose tissue volume. These ectopic fat stores are associated with a greater risk of disease incidence [15].

A study conducted on the elderly in Surabaya found a significant relationship between consumption sugar-sweetened beverages with incidence of diabetes mellitus.

In addition, the daily consumption patterns sugar-sweetened beverages have a significant relationship with the incidence of diabetes mellitus [11]. Average sugar consumption increases with age. People aged 19 years and over tend to consume sugar more than 50 g [1].

Consumption of sweet foods and drinks is also very popular in children. There is a relationship between consumption patterns of fruit syrup, flavored drinks, and chocolate, in daily frequency with the incidence of overweight / obesity [14]. Consumption of sweet foods and drinks in children can also cause children to reduce nutritious food and drinks, and will have an impact on the condition of deficiency of some important nutrients such as calcium, iron, folate, and vitamin A [13]. This of course needs to be watched out for, especially by parents so that children's growth can be good.

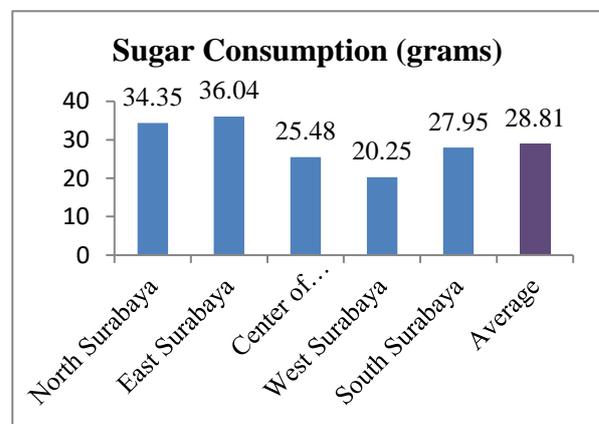


Figure 1. Surabaya people’s sugar consumption per capita per day

3.2. Cooking Oil Consumption

Surabaya residents are very fond of fried food, be it for side dishes or for snacks. Although fats and oils are part of a balanced diet that is also needed for a healthy life. However, if consumed in excess, it poses a risk to heart health. For fat intake, several studies have shown that saturated fatty acids are associated with a risk of heart disease. Cooking oil contributes to this fat intake from fried foods. Oil absorption is seen based on the percentage of oil absorption in each food ingredient.

In accordance with Permenkes Number 30 Year 2013, the total fat per day should not exceed 67 g to reduce the risk of stroke and heart attack. Nationally, around 27% of Indonesia's population had exceeded the suggested limit of total fat per day [1]. Figure 2 shows Surabaya people’s cooking oil consumption per capita per day based on the Surabaya area . The consumption of

cooking oil for Surabaya people in 2020 was 38.43 g/cap/day in average. This number was much higher than the national consumption of oil and fat in 2018 of 26.7 g/cap/day [7]. Even though the consumption of cooking oil was still within the government recommendations, it was necessary to notice that this number was only for cooking oil, not the total fat.

A study conducted by Atmarita et al [1], states that if you pay attention to fat intake for the Indonesian population, the majority of the contributions come from the meat and processed groups, as well as the composite food group (> 40%). This means that consumption of cooking oil, which has reached 38.43 g, must be very vigilant, because it is very possible that the consumption of total fat is quite high, far exceeding the recommended limit.

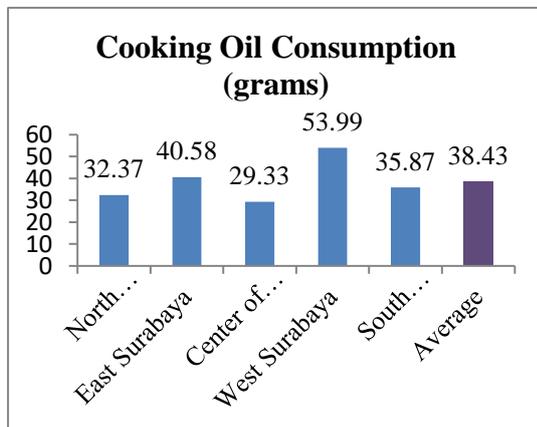


Figure 2. Surabaya people’s cooking oil consumption per capita per day

Indonesia is already at a very high risk of consumption of sugar and fat. And also the combination of this consumption of sugar and fat which indicates a dangerous situation[1]. Research conducted by Putri et al in Jakarta showed that children with more than or equal to 3 times per week fritter consumption and more than or equal to 3 times per week sugary drinks were at risk 6.8 times (CI 2.82 -16.52), and 10.7 times (CI 4.46-25.72) to overweight, respectively, compared with children with less than 3 times per week fritter consumption and less than 3 times per week high sugar drink [12]. Likewise, research conducted by Nisak and Mahmudiono [14] shows that there is a relationship between the pattern of consumption of fried foods in daily and weekly frequency with the incidence of overweight / obesity in school children.

4. CONCLUSION

Surabaya residents’ sugar and cooking oil consumption are 28.81 g and 38.43 g, respectively. Sugar and cooking oil consumption is still within safe limits according to the government recommendation. However, the sugar and cooking oil consumption does not take into account the sources of sugar and cooking oil/fat such as syrup, packaged sweet drinks, brown sugar, margarine, butter, and canola oil.

REFERENCES

- [1] Atmarita, A. B. Jahari, Sudikno, M. Soekatri, “Asupan Gula, Garam, Dan Lemak Di Indonesia: Analisis Survei Konsumsi Makanan Individu (SKMI) 2014”. *Gizi Indon.* vol. 39, no. 1, pp. 1-14, 2016.
- [2] Indrayana S, Palupi NS. Strategi Implementasi Pencantuman Informasi Kandungan Gula, Garam dan Lemak untuk Pencegahan Risiko Penyakit Tidak Menular”, *Jurnal Mutu Pangan.* 2014, vol. 1, no. 2, pp. 159-164, 2014.
- [3] Kementerian Kesehatan, “Badan Penelitian dan Pengembangan Kesehatan, Hasil Utama Riskesdas 2018 Provinsi Jawa Timur”. Jakarta : *Balitbangkes Kemenkes RI.* 2018.
- [4] Kementerian Kesehatan, “Badan Penelitian dan Pengembangan Kesehatan. 2018. Hasil Utama Riskesdas”, Jakarta. *Balitbangkes Kemenkes RI.* 2018.
- [5] WHO, “Diet, nutrition and the prevention of chronic diseases: report of a Joint WHO/FAO Expert Consultation. WHO Technical Report Series, No. 916. Geneva: *World Health Organization.* 2003.
- [6] Badan Pusat Statistik Kota Surabaya, “Kota Surabaya Dalam Angka 2020”. Badan Pusat Statistik, 2020.
- [7] Badan Ketahanan Pangan, “Direktori Perkembangan Konsumsi Pangan”, *Kementerian Pertanian Republik Indonesia,* 2019.
- [8] Kemenkes, “Permenkes Nomor 30 tahun 2013 tentang Pencantuman Informasi kandungan gula, garam, dan lemak serta pesan kesehatan untuk pangan olahan dan pangan siap saji”, 2013.
- [9] WHO, “Guideline: Sugars intake for adults and children”, Geneva: *World Health Organization/* 2015.
- [10] Malik VS, A. Pan, Willett WC, Hu FB, “Sugar-sweetened beverages and weight gain in children

- and adults: a systematic review and meta-analysis”, *Am J Clin Nutr.* vol. 98, no. 4, pp. 1084–1102, 2013.
- [11] P. Ramadhani, T. Mahmudiono, “Hubungan Konsumsi *Sugar-Sweetened Beverages* dengan Kejadian *Diabetemellitus* pada Lansia”, *MGI*. vol. 13, no. 1, pp. 49-56, 2018.
- [12] V.R. Putri VR, D. Angkasa, R. Nuzrina, “Konsumsi *Fast Food, Soft Drink*, Aktivitas Fisik, dan Kejadian *Overweight* Siswa Sekolah Dasar di Jakarta”, *IJHN*, vol. 4, no. 1, pp. 48 – 58, 2017.
- [13] Australian National Preventive Health Agency, “Obesity: *Sugar-Sweetened Beverages, Obesity And Health*”, *Australian National Preventive Health Agency.*, 2014.
- [14] A. J. Nisak, T. Mahmudiono T, “Pola Konsumsi Makanan Jajanan Di Sekolah Dapat Meningkatkan Resiko *Overweight/Obesitas* Pada Anak”, *Jurnal Berkala Epidemiologi*, vol. 5, no. 3, pp. 311-324, 2017.
- [15] So-Yun Yi, L. M Steffen, J. G Terry, Da. R Jacobs, Daniel Duprez, Brian T Steffen, Xia Zhou, James M Shikany, Lisa Harnack, John J Carr. Added sugar intake is associated with pericardial adipose tissue volume. *European Journal of Preventive Cardiology*, 2020; 204748732093130 DOI: [10.1177/2047487320931303](https://doi.org/10.1177/2047487320931303)