

RESEARCH STUDY

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College Students' Behavior Consuming Sugar-Sweetened Beverages (SSB) During the COVID-19 Pandemic

Perilaku Mahasiswa Mengonsumsi Sugar Sweetened Beverage (SSB) Selama Pandemi COVID-19

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ABSTRACT

Background: The development of Industry 4.0 makes it easy to access everything, such as food and beverages. Online food order platforms are often used among students nowadays. The COVID-19 pandemic has caused changes in purchasing behavior through online order services, especially with the policy of limiting community activities. Beverages such as boba, several types of tea, and coffee are often ordered online. Consumption for a long time and high frequency can increase body mass index, obesity, and the risk of non-communicable diseases.

Objectives: This study aimed to determine the impact of the development of online ordering behavior of consuming sweet drinks (SSB) during the COVID-19 pandemic among college students in Surabaya, Indonesia.

Methods: This was an observational study using a Mixed Method research design. A quantitative study with a Cross-Sectional research design and a qualitative study through an FGD was done.

Results: Based on the results of the descriptive test, it was shown that tea was the most frequently purchased (daily) through online orders (12.95%). Discount greatly influences the respondents' reasons for ordering online (68.4%). Through FGD, most respondents considered promos being the biggest motivation to order.

Conclusions: Currently, most 'modern' drinks are included in the SSB category. Consumption of SSB with repeated frequency for a long time will impact nutritional status. Government policies and related parties are needed to minimize the impact of SSB consumption habits, especially with the current pandemic.

INTRODUCTION

The development of Industry 4.0 brought many changes to human life. The presence of the Internet brings various conveniences to various activities. With easy access to information and globalization that can be accessed via the Internet, it can change human lifestyles and consumption patterns. Currently, purchases of goods and services can be made easily using the Internet, including purchasing food through online food delivery services¹. As many as 87.3% of online food ordering application users are mostly 17-24 years old².

The existence of the COVID-19 pandemic that occurred in Indonesia resulted in social restrictions such as the existence of a policy of imposing restrictions on community activities (PPKM)³. The PPKM policy resulted in people having to limit their activities, including enjoying the food they wanted directly at the restaurant⁴. This condition encourages people, including students, to

prefer to place orders using online food delivery applications. One study showed an increase in ordering food and drinks online by 20% compared to before the COVID-19 pandemic⁵. The ease of access and the many food choices also increase students' attractiveness to purchasing food through online food delivery services. In addition, a food delivery application provides complete access to various kinds of food. It can even be accessed for 24 hours, leading to uncontrollable types and quantities of food or drinks being purchased. If buyers, especially students, ignore nutritional needs and care about the problem of increasing body weight, it can negatively influence their nutritional status.

Currently, contemporary drinks are developing very rapidly. Contemporary drinks are a term used for popular drinks in society and are innovative in terms of taste and unique characteristics. Modern drinks include boba drinks, cheese tea, milk coffee with brown sugar,

Thai tea, regal drinks, and others⁶. Several contemporary drinks have high calories but significantly lack macro and micronutrients because of the high sugar⁷. These drinks certainly will contribute to an increase in body mass index (BMI) and the incidence of obesity and can trigger non-communicable diseases. The prevalence of overweight and obesity in adults is 13.6% and 21.8%. The prevalence of obesity in East Java is 13.7% and 22.4%, while the prevalence of overweight and obesity in Surabaya is 15.18% and 28%⁸.

Surabaya has the most significant number of tertiary institutions in East Java, Indonesia. The number of tertiary institutions in Surabaya was six state and 72 private universities, with 272,846 students in 2019⁹. Along with many students in Surabaya and the rise of online food delivery services in Surabaya, researchers wanted to know about the consumption behavior of sugar-sweetened beverages (SSB) during the COVID-19 pandemic.

METHODS

This research was done in Surabaya City from September to November 2021 through an online platform, SurveyMonkey. This research was observational, using a mixed method design through a quantitative study with a Cross-Sectional research design and a qualitative study through Focus Group Discussion (FGD) activities. Quantitative studies will be carried out on students regarding nutritional status, eating habits of fast food, frequency of using online applications, and the amount of expenditure by providing online surveys. Furthermore, quantitative survey results will be deepened through qualitative studies through FGD with selected students from various universities in Surabaya.

The independent variables in this study were the frequency of online orders and expenses for online orders, while the dependent variables in this study were the consumption of fast food and the nutritional status of the respondents. Measurement of these variables using a questionnaire divided into two parts: the respondent's identity and survey questions. The respondent's identity includes name, age, university, study program, gender, monthly allowance, weight, and height. The nutritional

status of the respondents was determined using the BMI. Meanwhile, the survey questions were related to the frequency of online orders, the types of food that are often ordered, the patterns of fast food consumption, and the types of fast food that are often ordered. Meanwhile, data analysis used for quantitative studies used logistic regression through the SPSS 25.0 software. Meanwhile, the results of the FGD will be analyzed using a triangulation and narrative analysis approach based on a predetermined theme.

The sample in this study was students from public and private universities in Surabaya. Based on the calculation of the Lemeshow formula, the sample size in this study was 500 students of public and private tertiary institutions. The inclusion criteria were: 1) Students studying at universities in Surabaya, 2) Have ordered online food, and 3) Willing to be research respondents. Exclusion criteria in this study were: 1) Respondents did not complete the survey, and 2) Students of more than nine semesters. Determining the sample size in this study used the accidental sampling technique by taking respondents who happened to be there and met the research requirements. Based on the inclusion and exclusion criteria. There were only 316 students who were sampled in this study. This research was approved by the Health Research Ethics Commission of the Faculty of Public Health, Universitas Airlangga (KEPK FKM UNAIR) on October 25, 2021, with the number 46/EA/KEPK/2021.

RESULTS AND DISCUSSION

As many as 316 students agreed and met the inclusion criteria specified as respondents in this study. The majority of respondents in this study were women (82.6%). Students from Airlangga University constituted the majority in this study (80.1%). In addition, most respondents came from health majors such as medicine, nursing, public health, nutrition, and others (67.8%). Respondents' average monthly stipend is less than IDR 500,000 (47.3%). Based on the BMI calculation through the respondents' weight and height, it was found that 68.1% of the respondents had normal nutritional status. The characteristics of these respondents can be seen more clearly in Table 1.

Table 1. Characteristics of 316 students who met the criteria as respondents

| Variable | n | % |
|-------------------------------|-----|-------|
| Gender | | |
| Man | 55 | 17.4% |
| Woman | 261 | 82.6% |
| Age (years) | | |
| 17 | 2 | 0.6% |
| 18 | 38 | 12% |
| 19 | 69 | 21.8% |
| 20 | 70 | 22.1% |
| 21 | 72 | 22.7% |
| 22 | 55 | 17.7% |
| 23 | 8 | 2.5% |
| 25 | 1 | 0.3% |
| 26 | 1 | 0.3% |
| Mean = 20.21 ± 1.437 SD | | |
| University | | |
| Universitas Airlangga (UNAIR) | 253 | 80.1% |

| Variable | n | % |
|--|-----|-------|
| Universitas Negeri Surabaya (UNESA) | 23 | 7.3% |
| UIN Sunan Ampel | 7 | 2.2% |
| Institut Teknologi Sepuluh November (ITS) | 5 | 1.6% |
| UPN Veteran Jawa Timur | 4 | 1.3% |
| Universitas Surabaya | 3 | 0.9% |
| Universitas Hang Tuah | 1 | 0.3% |
| Universitas 17 Agustus 1945 Surabaya | 1 | 0.3% |
| Universitas Muhammadiyah Surabaya | 1 | 0.3% |
| Other | 18 | 5.7% |
| Study program | | |
| Health (Medicine, Pharmacy, Nursing, etc.) | 214 | 67.8% |
| Science (Mathematics and Science, Engineering, etc.) | 26 | 8.2% |
| Social sciences (Law, Social, and Political, etc.) | 76 | 24% |
| Pocket Money per Month | | |
| <IDR 500,000 | 150 | 47.3% |
| IDR 500,000-IDR 1,000,000 | 120 | 38.2% |
| IDR 1,000,000-IDR 2,000,000 | 30 | 9.5% |
| >IDR 2,000,000 | 16 | 5% |
| Nutritional Status Based on Body Mass Index (BMI) | | |
| Overweight and Obese | 101 | 31.9% |
| Non overweight and Non Obese | 215 | 68.1% |

Table 2 shows that 43.7% of respondents stated that restaurant ratings greatly influence purchasing sugar-sweetened beverages SSB online. This research aligns with a study showing that ratings affect consumer trust and interest in ordering food and drinks online¹⁰. It was also supported by the statement of one of the students in the FGD forum:

"I usually look at the ratings or results of people's reviews of restaurants or places to eat before deciding to buy at that restaurant."

This study also showed that 30.1% of respondents stated that the influence of attractive product photos dramatically influences the decision to buy SSB online. In line with a study, the appearance of products sold online positively and significantly affects a person's purchase intention in an online food and beverage delivery service application¹¹. One of the FGD participants stated that:

"I think attractive product photos make me more interested in trying and buying sweetened drinks (SSB) even though I do not want these products."

At the question point to assess how much influence advertising/promotion has on social media, 47.8% of respondents answered that it affected purchasing decisions. The widespread use of the Internet and social media encourages business owners to carry out digital promotions presented in an attractive and more up-to-date form. Meanwhile, regarding how much

experience they have tried the product before, the survey showed that 51.6% of respondents considered the experience of trying a product very influential on buying products online. In the FGD forum, one of the participants said:

"This brand is this, I am afraid if you try something else, it will not work and doesn't meet expectations. So just a subscription brand."

In addition, discounts are the most influential factor in buying SSB online (68.4%). This result is in line with a study that states that more frequent discounts on SSB products are associated with high per capita purchases, so limiting discounts on SSB products allows for reducing purchases, per capita consumption, and causes of illness effectively¹². One of the students in the FGD also stated that:

"I prefer buying sweetened drinks (SSB) through online orders because there are many discounts offered compared to healthier products at the same price."

This result is supported by a study that states that the prevalence of high-price discounts on healthy products and SSB compared to healthier products has a higher purchasing potential for consumers¹³. Other studies have also found that the potential for increased public health problems is associated with discounts given to unhealthy drinks and sugar-sweetened beverages (SSB)¹⁴.

Table 2. Reasons for students ordering sugar-sweetened beverages (SSB) Online

| Question | Very Ineffective | | No effect | | Neutral | | Influential | | Very influential | |
|---|------------------|-----|-----------|------|---------|------|-------------|------|------------------|------|
| | n | % | n | % | n | % | n | % | n | % |
| How influential is the rating of the restaurant? | 5 | 1.6 | 8 | 12.5 | 57 | 18 | 108 | 34.2 | 138 | 43.7 |
| How influential are attractive product photos? | 1 | 0.3 | 10 | 3.2 | 45 | 14.2 | 165 | 52.2 | 95 | 30.1 |
| How effective is advertising/promotion on social media? | 1 | 0.3 | 8 | 2.5 | 61 | 19.3 | 151 | 47.8 | 95 | 30.1 |
| How significant is the experience of trying food? | 0 | 0 | 7 | 2.2 | 40 | 12.7 | 106 | 33.5 | 163 | 51.6 |
| How much influence does the discount have? | 0 | 0 | 2 | 0.6 | 14 | 4.4 | 84 | 26.6 | 216 | 68.4 |

In the FGD forums, most respondents feel that promos will significantly influence the motivation to buy through online orders. Half of the respondents who attended the forum claimed three online order platforms. One of the respondents said:

"I have all three online order platforms to compare which is more affordable."

One of the other students also added:

"This week I've ordered Geprek Bensu three times because it's on a promo, it's cheap, it just happens to be close to my house."

Promos provided by online platforms usually apply minimum purchase requirements that apply. This condition is a driving force for buyers to buy more than what is needed. By purchasing following the minimum purchase requirements, consumers will be able to get a promo so that the total price paid will be cheaper. When asked about the reasons for using the promo, one of the FGD participants answered as follows:

"If I usually follow the minimum purchase amount, the quantity is indeed more, but it becomes cheaper."

The results of this study indicate that respondents also have a habit of ordering sugar-sweetened beverages (SSB). Most of these drinks were ordered with a monthly frequency. This study shows that ordering types of tea drinks ranks first in online ordering. Ordering and consuming contemporary tea drinks with a daily frequency reaches 12.95% of respondents. Tea is the second most consumed drink in the world after water. Even the habit of drinking tea is found in 80% of households in the United States.¹⁵ In line with several studies showing that SSB drinks are trendy among students who are generally 18-25 years old¹⁶, 19-34 years¹⁷, and 20-30 years¹⁸. In the FGD forum, one of the

students involved in the FGD said:

"I mostly buy drinks in online ordering applications, namely tea (Thai-tea) and boba, to improve my mood for the better and try the various new variants available."

These words align with a study that states that the factors influencing ordering modern tea drinks online are to get rid of boredom or improve mood, and there is an interest in trying these drinks¹⁹. The frequency of ordering and the type of SSB can be seen in detail in Table 3. SSB consumption habits can increase sugar consumption, impacting the risk of type 2 diabetes mellitus (DM)²⁰ and cardiovascular disease²⁰⁻²². SSB also contains high calories, increasing a person's total calorie intake. This condition will increase body weight and the risk of obesity²³. The fructose content in SSB, which has a high glycemic index (GI), can also increase the risk of insulin resistance, visceral fat accumulation, and increased triglyceride and cholesterol levels. As said by one of the students in the FGD:

"I think sweet drinks such as tea and boba contain high sugar. These ingredients can cause obesity and increase the risk of diabetes mellitus."

Recent studies have shown that drinking about 1 liter or the equivalent of 16 ounces of SSB daily for six months can trigger metabolic syndrome and fatty liver²⁴. SSB can also cause a feeling of not being full and increasing energy intake. Excessive consumption of these SSBs and boba drinks can contribute to higher overweight and obesity²⁵.

A study conducted showed that adults who drank one more SSB per day were 27% more likely to be overweight or obese than people who did not consume²⁶. Therefore, considering the existing problems, a regulation or policy is needed regarding the rules and limits for permissible SSB consumption, such as information on the amount of nutritional content and

sugar used in an SSB. One student said that:

"We as buyers have to be smart, not to buy (online orders) all the time. Sellers should also innovate by providing nutritional value so that we also know the nutritional content. Mrs. Susi can only move her to eat fish. The government should be able to cooperate so that they eat other foods."

This statement is supported by a study that states that nutritional content labels, especially the added sugar content and high calories in products sold, effectively increase consumer attention to the products purchased²⁷. However, other studies have concluded that this does not significantly influence consumer purchasing decisions²⁸. Through discussing problem solutions, one of the students during the FGD stated that:

"Most of the food sold online is high in fat or sugar. It's good that there is education for the sellers if they can open a new market online to improve the food that doesn't exist yet, not modify it from other food. The government, maybe in the creative economy, can provide a socialization program for people who want to sell online. Maybe they will be given education so they don't increase the height of sugar and fat."

Another FGD participant added:

"The seller might be able to improve the

nutritional appearance. Alternatively, you can also apply healthy conditions (considering the nutritional content of food) before registering (as a seller on the online order platform)."

Therefore, the presence of regulations or policies regarding rules and limits on consuming sugar-sweetened beverages (SSB) has enormous potential to reduce SSB consumption. Align with research which states that a 20% price increase in SSB due to SSB taxes results in decreased energy of 24.3 kcal per day per family member²⁹. The SSB tax is regulated based on the increasing prevalence of non-communicable diseases, such as diabetes mellitus. Research that has been done projects that the SSB tax implemented in Mexico can substantially reduce morbidity and mortality from diabetes and cardiovascular disease while reducing health care costs³⁰. Limitations of this study were that the questionnaire used is less specific at the consumption frequency level and does not include the size or portion of food ingredients. In addition, 67.8% of the respondents who filled out the questionnaire were students from the health study program, so this could lead to bias because they might have understood the negative impact of SSB. In addition, the advantage of this research is that using a mixed method carried out through quantitative studies in the form of surveys and qualitative studies in FGD allows for obtaining more in-depth data regarding the reasons underlying SSB consumption behavior during the COVID-19 pandemic.

Table 3. Types and frequency of ordering sugar-sweetened beverages (SSB) online

| Variable | Frequency | | | | | |
|---------------------------------------|-----------|--------|--------|-------|---------|-------|
| | Daily | | Weekly | | Monthly | |
| | n | % | n | % | n | % |
| Fizzy drinks (Fanta, Coca-Cola, etc.) | 7 | 2.2% | 57 | 18% | 253 | 79.8% |
| Boba drink | 5 | 1.6% | 76 | 24% | 236 | 74.4% |
| Coffee | 25 | 7.9% | 98 | 30.9% | 194 | 61.2% |
| Tea | 41 | 12.95% | 132 | 41.6% | 144 | 45.4% |
| Sweet drinks | 28 | 8.8% | 105 | 33.1% | 184 | 58% |

CONCLUSION

This study examined the effect of online ordering developments on sugar-sweetened beverages (SSB) consumption behavior during the COVID-19 pandemic among college students in Surabaya, Indonesia. Tea-type drinks are consumed the most in daily quantities compared to other SSB types, such as soft drinks, boba drinks, coffee, and sweet drinks. In the long term, consuming SSB with repeated frequency will increase the risk of obesity, diabetes mellitus, and cardiovascular disease. Therefore, in addition to control from potential consumers, government policies and related parties are also needed to minimize the impact of consumption habits of sugar-sweetened beverages, especially with the current pandemic conditions.

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Conflict of Interest and Funding Disclosure

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