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Reducing the Consumption of Sugar-Sweetened Beverages among Children and Adolescents

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Abstract

This study focused on the link between sugary beverage intake and health consequences, especially in children and adolescents. Children and adolescents consumed more sugary beverages than the general population, increasing their risk of developing excessive weight gain in the future, which may lead to significant health consequences. While there are few studies about sugary drink consumption among Indonesian children and adolescents, there is a need to control the increasing trend of sugar-sweetened beverage consumption in Indonesia. This study looked into studies from other countries to learn more about the determinants of sugary drink consumption, the challenges of reducing sugary drink consumption, and various policies to reduce sugary drink consumption among children and adolescents. Using a scoping review, this study examined 21 papers that were relevant to the study's objectives. Several researches have linked excessive sugary drinks to a variety of negative health effects in children and adolescents, including an increase in unhealthy weight gain, the onset of hypertension, an increased risk of cardiovascular disease, and diabetes. Determinants of sugary drinks consumption among children and adolescents were socioeconomic status, physical activities, dietary behaviour, parents, and home environment. This study also discovered several policies in different countries intended to reduce sugary drink consumption, such as taxation, institutional changes, and raising awareness. Findings from this study may guide future research on sugar-sweetened beverage consumption among Indonesian children and adolescents, as well as raise the awareness among stakeholders, such as parents, children and adolescents, health professionals, and policymakers, on the need of preventing excessive sugar-sweetened beverage intake.

Keywords: children and adolescents; noncommunicable disease; sugary drink

Introduction

The changing of the population with dietary behaviour has had a negative impact on people's health. Over the last three decades, there has been an increase in non-communicable diseases (NCDs) among the population worldwide. NCDs, such as ischemic heart disease, stroke, and diabetes, are among the top 10 causes of death and disability, according to the Global Burden Disease Report (Abbafati et al., 2020). NCDs have a high economic burden, increase poverty, and widen health disparities (Cesare et al., 2013; Hunter & Reddy, 2013). However, NCDs, are preventable, by maintaining a

healthy lifestyle of diet (Eyles et al., 2012). Evidence shows that the significant rise in obesity and sugary drink consumption is linked to the rise in chronic diseases (Kansagra et al., 2015; Muth et al., 2019; Sundborn et al., 2014). Obesity is mostly caused by excessive calorie consumption over time. Furthermore, studies have connected excessive sugary drink consumption to obesity and the risk of several chronic diseases (Vos et al., 2017).

Among the population groups, children and adolescents are more vulnerable to sugary drinks, but they are also crucial in preventing the spread of noncommunicable diseases. When compared to other age groups, children and adolescents consume more sugars as a percentage of their overall caloric intake (Azaïs-Braesco et al., 2017). While providing unnecessary nutrition, sweetened beverages are the most prevalent source of added sugar in people's diets, especially for children and adolescents (Sylvetsky et al., 2020; Tasevska et al., 2017; Thornley & Sundborn, 2014). Excess sugary drink consumption has been linked to an epidemic of unhealthy weight gain and a variety of chronic illnesses (Sylvetsky et al., 2020). Obesity rates among children are growing at a quicker pace than obesity rates among adults, according to a research (Friedrich, 2017). Obese children are more likely to acquire unhealthy weight during adulthood (Monge-Rojas et al., 2020).

While research on sugar-sweetened beverages (SSBs) has been undertaken in high-income countries, information from low- and middle-income countries is lacking. According to Malik & Hu (2022), SSBs are consumed globally, with intake levels above the recommended daily limits for free sugar (50 gr and 10% of daily intake) in many high-income countries and on the increase in low-income and middle-income countries. A study conducted by Rosinger et al. (2017) in the United States found that adolescents consume more SSBs than other demographic groups in the country. Although there is little information on SSBs consumption in low-middle-income countries, various research in Indonesia has examined SSB consumption in the population.

Several pieces of research have shown that the Indonesian population consumes a large amount of SSB. While the National Socioeconomic Survey of 2017 revealed that sugary drinks accounted for a significant amount of household expenditure (67.2%), the Basic Health Research Survey of 2018 reported that 61.3 percent of Indonesians aged 3 years consumed at least one SSB per day (Sartika et al., 2022). Moreover, according to a survey of 3,644 Indonesians aged 4-65 years in 32 cities, SSBs are the third-largest source of liquid intake in Indonesia, behind water and hot drinks (Laksmi et al., 2018). Although Laksmi et al. (2018) reported that SSB consumption of added sugar is still below WHO guidelines, Nurwanti et al. (2019) revealed that daily SSB consumption is a risk factor for overweight and obesity, particularly in urban areas. However, Sartika et al. (2022) examined the socio-cultural background of Indonesian sweet tastes in general contexts, including historical and political issues, with no significant variations between rural and urban areas. The research also discovered that in certain places, such as East Jakarta and Bandung, SSBs account for over 20% of adolescents' total calorie consumption, surpassing the 10% limit permitted (Sartika et al., 2022). The considerable consumption of SSB among Indonesians corresponded to an increase in overweight in those under the age of 18 and an increase in obesity in people aged 18 and above, rising from 15.4 percent to 21.8 percent, between 2013 and 2018 (Sartika et al., 2022). It might be an indication that children and adolescents need early intervention with SSBs consumption before they get addicted to them.

Obesity prevention in children and adolescents is critical to avoiding future obesity and chronic disease. Given the large contribution of carbs and sugar to total

calorie intake in the Indonesians' dietary behaviour, as well as the rise in overweight and obesity among Indonesian adolescents, it is critical to keep SSB consumption under control. However, as part of its attempts to reduce noncommunicable diseases, the Indonesian government has not developed a comprehensive programme to restrict sugar intake, including SSBs consumption (Sartika et al., 2022). This research aims to emphasise the need of lowering sugary drink intake among children and adolescents, as well as provide a variety of interventions or strategies to help them do so. To achieve the research objective, several issues on SSBs will be explored in this study. The first topic will address the link between sugary drinks and the growth in NCDs. Following that, the report will lay out several roadblocks to lowering SSB consumption, especially among children and adolescents. Finally, many public health measures will be developed to improve population diet and minimise SSB usage among children and adolescents.

Methods

This study used a scoping review, a method of analysing the literature, to investigate evidence on the relationship between SSB intake and poor health outcomes, as well as to identify specific policies that have been implemented to limit SSB consumption among children and adolescents. The author conducted the review in five phases, using the scoping methodology outlined by Arksey & O'Malley (2005). The initial stage was to formulate research questions and find relevant papers.

The search was conducted in the Medline database of a systematic review. The keywords used to identify the related studies were changed and mixed according to the purpose. The star (*) sign was used to indicate that the word might be plural or single. The author defined the demographic category as "adolescent* or child*." The terms "sugary drink* or sugar-sweetened beverage* or dietary sugar or sweet beverage*" were used to precisely identify product consumption and "dietary or feeding behaviour" to broadly capture the children and adolescent consumption behaviour. "Non-communicable disease or degenerative disease or chronic disease or obesity" were used to describe the negative health effects of excessive sugary drink intake. Furthermore, "access* or affordability" was used to determine the affordability of sugary beverages. Lastly, "tax* or polic* or regulation or management or strateg*" was used to explore policies or interventions to reduce the consumption of SSBs. Each word group was combined to find studies that were suitable for this research.

After that, the studies would be selected, and the data and information from the chosen research would be plotted. The inclusion criteria for the studies to be considered were relevant to this study subject and were authored in English. The inclusion criteria did not include the year or country in which the studies were completed. The author selected the studies by reading the titles and analysing the abstracts. Studies addressing the link between excessive sugary drink intake and poor health outcomes in children and adolescents, as well as studies examining policies governing SSB consumption in children and adolescents, would be included. Finally, the data and information were compiled, summarised, and reported in the results. The data and information from the studies were gathered and organised in a table that includes the study's title, authors, methodology, conclusions, and any relevant information to the study's objective. The data from the summary will next be analysed to address the research objectives.

Results

The initial search found 174 studies using keywords of the association between SSBs consumption and poor health outcome among children and adolescents, 255 papers using keywords of SSBs consumption's determinants, and 222 articles using keywords that related to SSBs' policies. After removing duplicates and irrelevant studies, there were 21 studies collected between 2009 and 2021 from various countries, but mostly from the United States. The studies provided one or more aspects of the research objectives, including the relationship between sugary drinks and poor health outcomes, the determinants of excessive sugary drink consumption, and policies to reduce excessive sugary drink consumption. Each aspect covered by the studies have been summarised in Table 1 below as well as the authors, year, country, and study type. Although the literature searching used separate phrases for each research purpose, the author opted to aggregate all relevant papers from several search terms because the final selected studies included more than one topic.

Table 1. Summary of Selected Studies

No	Reference	Country	Study type	Link between SSBs consumption and poor health	Determinants of SSBs consumption	Policies to reduce SSBs consumption
1	Bleich et al., 2014	The United States	Case-crossover study	None	None	They found that providing caloric information might reduce the number of SSBs purchased among Black adolescents.
2	Bogart et al., 2013	South Africa	Qualitative study applying semi-structured interviews	None	Parents' belief on sport drinks and availability of sugary drinks in home are key factors in SSB consumption among Latino youth.	None
3	Cawley et al., 2019	Not applied	Literature review	None	None	They reviewed the economic effects of SSBs taxes, including the prices, sales, and consumptions.
4	Chazelas et al., 2019	France	Prospective cohort study	They found the relation between SSB intake and the risk of cancer, particularly breast cancer, among adults over 18 years old.	None	None

5	Fichera et al., 2021	Spain	Difference-in-differences approach using available dataset (loyalty card data)	None	None	They analysed the effect of taxes on consumer behaviour. They found a reduction in purchases of taxed beverages and a small increase in purchases of untaxed beverages.
6	Hartigan et al., 2017	The United States	Literature review, survey, and implementing campaign	None	None	Campaigning healthy drinks consumption at a children's hospital decreased the SSBs' sales in the hospital.
7	Kansagra et al., 2015		Literature review	The increase of chronic disease is in line with the significant rise of obesity and sugary drink consumption as excessive SSBs consumption increased body fat and body mass index (BMI).	None	New York local government has regulated nutrition standard for every beverage sold in vending machine, encouraging beverage manufacturers to make changes to their goods to make them less sugary and lower in calories.
8	Krieger et al., 2021	The United States	Literature review	Higher sugary drink consumption resulted in poor health outcome.	Due to the prevalence of fast-food restaurants among the low socioeconomic community, people with lower income tend to consume more sugar-sweetened drinks.	Multiple policies, including taxation, education, and working with fast food restaurant were needed to combat excessive sugary drinks consumption. However, implementing such strategy were challenging since there was a lag between implementing the policy and the health outcome. Several benefits of taxation were described in this paper as well as encouragement to provide equity while increasing people awareness through written language.

9	Lombardo et al., 2015	Italia	Quantitative approach using population-based study	None	Parent's education level and knowledge played a big role on children obesity	None
10	Mendez et al., 2019	The United States	Quantitative study	None	Psychosocial factors, systemic inequities, and environmental characteristics make it difficult for those with low socioeconomic status to reduce their sugary drinks intake.	None
11	Monge-Rojas et al., 2020	Costa Rica	Quantitative study	While children's SSB consumption continues to rise, sugary drink consumption has been linked to weight growth in children and adolescents. Children with obesity are more prone to acquire obesity during adulthood.	None	Encourage the consumption of healthier drinks by ensuring that non-sugar sweetened alternatives are accessible in public places such as schools and restaurants.
12	Muth et al., 2019	The United States	Policy statement using literature review	They found the impact of sugary drinks consumption on increased body fat and body mass index (BMI).	None	None
13	Nguyen et al., 2009	The United States	Quantitative study analysing cross-sectional data	The researchers discovered an independent relationship between sugary soft drinks and greater serum uric acid and systolic blood pressure in adolescents, which was linked to the beginning of primary hypertension.	None	None
14	Ruyter et al., 2012	The Netherlands	Randomised-control study	None	When compared to comparable populations that consume less sweetened beverages, children and adolescents who consume excessive amounts of sugary drinks have greater daily energy intakes.	None

15	Smith & Holloman, 2014	The United States	Quantitative study evaluating the applied intervention, before and after.	None	Encouragement from peer might affected students sugary drink consumption.	Peer education and challenge to consume only unsweetened beverages for 30 days decreased the consumption of sugary drink and increased water intake.
16	Sundborn et al., 2014	New Zealand	Literature review	The increased of chronic disease are linear with the dramatic increase of obesity and SSBs consumption.	Sugary drink products are more inexpensive and accessible to children and adolescents than healthy liquids like water and milk, due to marketing strategies. Furthermore, some individuals get hooked to sugary drinks, making it difficult to quit.	Regulating the availability of unsweetened drinks and prohibiting the sale of unhealthy products may assist to minimise sugary beverage consumption. Furthermore, the utilization of creative advertisements efficiently promotes the negative consequences of SSB intake.
17	Sylvetsky et al., 2020	The United States	Qualitative study using focus group discussions	Sugary beverages offer unneeded nourishment and have become the most common source of added sugar in people's diets, particularly among children and young people. It also plays a crucial role in the pandemic of excessive weight gain and the onset of numerous chronic illnesses.	After having sugar-sweetened drinks, children and adolescents recognised a need as well as various advantages, including physical, cognitive, emotional, and interpersonal. Sugary beverages also help them feel better and more energised. Additionally, parents and the home environment have a substantial effect in the consumption of sugary beverages by children and adolescents.	None
18	Tasevska et al., 2017	The United States	Quantitative study applying cross-sectional telephone household survey		Sedentary behaviour, a high fast-food intake, parent and household-level characteristics were found to be associated with higher sugary drink consumption among children and adolescents from low-income families	

19	Thornley & Sundborn, 2014	New Zealand	Literature review	SSBs consumption is related to weight gain among children and adolescents	Sugary drinks are highly addicting, causing withdrawal symptoms in children and adolescents who try to limit their consumption.	None
20	Vos et al., 2017	The United States	Literature review	This study provided various negative impact of excessive sugary intake on children and adolescents health, including obesity, diabetes, hypertension, coronary heart disease, and cardiovascular disease.	Because of their great preference for a sweet flavour, children and adolescents consume more SSBs. Parents, on the other hand, contribute to the early introduction of added sugars into children's meals and may encourage their offspring children to have a sweet taste preference in the future.	None
21	Watts et al., 2018	The United States	Quantitative approach using cross-sectional, population-based study	None	Sedentary behaviour, high fast-food intake, parents' lifestyle and soda availability at home associated with higher sugary drink consumption among children and adolescents	None

Discussion

This study explores the association between SSBs and negative health outcomes in children and adolescents, determinants of SSB intake, and policies to maintain SSB intake among children and adolescents in several countries to highlight the need to limit SSB intake among children and adolescents in Indonesia. Excess sugary drink consumption has been related to obesity and the development of noncommunicable illnesses such as diabetes, hypertension, cardiovascular disease, and cancer (Chazelas et al., 2019; Kansagra et al., 2015; Monge-Rojas et al., 2020; Muth et al., 2019; Sundborn et al., 2014; Vos et al., 2017). While some studies that relate SSB consumption to negative health outcomes examined at the factors that influence SSB consumption, others explored at policies and interventions aimed at preventing excessive SSB consumption among children and adolescents. Internal and external factors are found to be determinants of SSB consumption among children and adolescents, including knowledge about the negative effects of excessive SSB consumption and strong sweet preferences among children and adolescents for internal factors, and lifestyle, food habits, and family for external factors (Bogart et al., 2013; Sylvetsky et al., 2020; Tasevska et al., 2017; Vos et al., 2017; Watts et al., 2018). Furthermore, various approaches to lower SSB intake from the supply and demand sides were elaborated on in this section.

Various Approaches to Lower SSB Intake from The Supply and Demand Sides

1. Evidence linking SSB consumption to poor adolescent and child health

SSB intake has had a negative impact on population health. The NutriNet-Santé cohort in France found a relationship between sugary drink consumption and cancer risk, notably breast cancer (Chazelas et al., 2019). Additionally, Sugary drink consumption has also been attributed to greater body fat and BMI in studies (Kansagra et al., 2015; Muth et al., 2019; Sundborn et al., 2014). These circumstances lead to unhealthy weight gain or obesity, which raises the risk of NCDs, including hypertension, diabetes, cardiovascular disease, and coronary heart disease (Vos et al., 2017). Cardiovascular disease was the leading cause of death in 2015, which was significantly connected to obesity. From 1990 to 2015, obesity caused 28.3% of world death and 35.8% of global disability (Friedrich, 2017).

Children and adolescents' health may be harmed by excessive SSB consumption. Weight gain in children and adolescents has been related to sugary drink intake (Monge-Rojas et al., 2020; Thornley & Sundborn, 2014; Sylvetsky et al., 2020; Vos et al., 2017). Children and adolescents who drink a lot of SSBs have higher daily energy intakes than those who drink less sweetened drinks (Ruyter et al., 2012). Accordingly, the study found that obesity in children and adolescents is caused by excess daily calorie consumption from sugary beverages and physical inactivity (Vos et al., 2017). Obesity is a risk factor for a variety of NCDs in children and adolescents, including hypertension, coronary artery disease, stroke, and diabetes.

In addition, Nguyen et al. (2009) identified a separate relationship between sugary soft drinks and higher serum uric acid and systolic blood pressure in adolescents. The beginning of primary hypertension is closely associated with a rise in serum uric acid and systolic blood pressure. Among children, excessive sugary drink intake is linked to greater triglyceride levels and lower HDL levels, which is a risk factor for cardiovascular disease, according to an American Heart Association systematic review. In addition, children who ate more SSBs had higher fasting glucose levels and lower insulin sensitivity, all of which are risk factors for type 2 diabetes (Vos et al., 2017). Limiting SSB consumption in children and adolescents is a public health concern due to the harmful consequences on population health.

2. Factors influencing SSB intake

Despite research showing that excessive sugary drink consumption has a variety of detrimental consequences, the demand for SSB remains high, especially among children and adolescents. In recent decades, consumption of SSBs among children and adolescents has grown considerably across countries (Kansagra et al., 2015; Monge-Rojas et al., 2020; Sundborn et al., 2014). According to Tasevska et al. (2017), more than 90% of low-income children and adolescents consume at least once per day and more often, especially among 12 to 15-year-olds. Low-income people are more likely to drink sugar-sweetened beverages (Krieger et al., 2021). Children and adolescents consume more SSBs due to their strong preference for sweet flavours (Vos et al., 2017). They also feel better and more energised after drinking sugary beverages (Sylvetsky et al., 2020).

Certain determinants of SSBs consumption among children and adolescents were discovered in this study. Internal factors such as personal activity and eating habits are the first to consider. Sedentary children and adolescents who consume a lot of fast food tend to drink more sugary beverages (Tasevska et al., 2017; Watts et al., 2018). Furthermore, the consumption of SSBs commonly substitutes for the intake of

healthful liquids like milk and water (Watts et al., 2018). Children and adolescents that consume a lot of sugary beverages have decreased vegetable intake (Tasevska et al., 2017).

Moreover, a variety of external factors have an impact on the behaviour of children and adolescents. Parental and household-level characteristics are linked to greater consumption of SSBs among children and adolescents from low-income households, according to Tasevska et al. (2017). If their parents have less than a high school degree and a high intake of SSBs, children and adolescents are more prone to consume sugary beverages. Watts et al. (2018) also found that having soda at home correlates significantly to the consumption of SSBs. Another research, by Sylvetsky et al. (2020), highlighted the relevance of parents, since the majority of children and adolescents in the study got their sugary drinks from their parents and drank sugar-sweetened beverages at home. Restricting sugary drink consumption among children and adolescents would be challenging due to a range of variables influencing SSB intake.

3. Obstacles to limiting SSBs among children and adolescents

The first challenge is that sugary drinks are popular among children and adolescents. After consuming sugar-sweetened drinks, children and adolescents perceived a need as well as a variety of advantages, including physical, cognitive, emotional, and interpersonal benefits, according to a recent research by Sylvetsky et al. (2020). They feel satisfied and happy after drinking a sweet beverage. They said that having SSBs increased their performance and concentration. Sugary beverages provided an interpersonal benefit for children and adolescents, allowing them to engage in social activities. Sugar, on the other hand, is addictive, and if children and adolescents are aware of the detrimental consequences of sugary beverages and strive to reduce their consumption, they may suffer withdrawal symptoms (Thornley & Sundborn, 2014). SSBs have a similar impact on our bodies to cigarettes in that they impair our health and are difficult to stop due to addiction (Sundborn et al., 2014).

Another challenge is the children's and adolescent's families, particularly in terms of the food culture. Parents have a role in the early introduction of added sugars into children's meals and may increase their children's desire for sweet flavours in the future (Vos et al., 2017). Parents' characteristics, parents' knowledge of the sugary drink impact, parents' food intake, and the availability of SSBs at home have been connected in studies on children and adolescent sugary drinks intake (Bogart et al., 2013; Sylvetsky et al., 2020; Watts et al., 2018). Children still consume sugary drinks at home, even if efforts to eliminate sugary beverages from schools have been largely adopted (Sylvetsky et al., 2020). However, if parents are interested in healthy food and leading a healthy lifestyle, their children and adolescents will consume far less SSBs (Watts et al., 2018).

Sugary drink consumption is often greater among the lowest socioeconomic group, and this behaviour has detrimental consequences (Krieger et al., 2021). The impact of SSBs consumption is exaggerated by the underlying component, socioeconomic status. People with low socioeconomic levels find it difficult to control their consumption of sugary drinks due to psychological factors, system disparities, and environmental problems (Mendez et al., 2019). Additionally, parents with a poor level of education are more likely to underestimate the severity of paediatric obesity due to a lack of understanding about the health impacts of obesity (Lombardo et al., 2015). The external factor, the common fast-food restaurant in the poor socioeconomic neighbourhood,

also encourages children and adolescents to consume sugary drinks (Krieger et al., 2021).

Finally, the impediment to lowering SSB intake in children and adolescents is the government's political willingness to recognise the rising health problem caused by sugary drink consumption. Despite extensive evidence demonstrating the harmful effects of excessive sugary drink consumption in children and adolescents, establishing a health programme to reduce the consumption of SSBs among children and adolescents is challenging for two reasons. First, the beverage sector will endeavour to prevent it since SSB interference will impact their business. SSB industries have attempted to increase sales by marketing its product to people, notably children and adolescents. Sugary drinks are increasingly less priced and more readily available to children and adolescents than healthful beverages like water and milk (Sundborn et al., 2014). SSBs are cost-effective for children and adolescents because they provide a huge quantity of delicious drinks for a cheap price.

Another aspect to consider is that observing the effects of reducing sugary consumption in children and adolescents would take many years. The long-term objective of the intervention, which is to produce healthier children and adolescents in the next generation, cannot be assessed in the near term. There is a time delay between policy implementation and health results. While the drinking sector would strongly fight such a programme, certain parties are skeptical of its effectiveness (Krieger et al., 2021). Similar to the cigarette intervention, which took a long time to implement, proposing a sugary drink intervention at the macro level requires a huge effort from a wide range of stakeholders, not only the health sector.

4. Public health strategies and actions to limit SSB intake among children and adolescents

Despite the challenges and obstacles in reducing sugary drink consumption among children and adolescents, certain countries, such as New Zealand, the United States, Mexico, France, and others, have established a variety of regulations and programmes to limit SSB intake. This section will discuss several strategies for assisting children and adolescents in living healthier lives and reducing consumption of SSBs by interfering with certain SSBs elements. Sugary drink regulations include increasing product pricing, rising awareness, restricting SSB accessibility, and promoting healthier beverages.

Taxation

Since the 2000s, certain countries with high obesity rates, such as Fiji, Kiribati, Samoa, and Tonga, have implemented taxation field (Cawley et al., 2019). The implementation of SSB taxes and excise aims to limit sugary drink consumption by increasing SSBs retail costs. Taxation encourages children and adolescents to drink healthy liquids because it decreases the price of unsweetened beverages compared to sweetened beverages. According to research, taxing has lowered beverage sales and purchases of taxed drinks while boosting purchases of non-taxed beverages (Fichera et al., 2021). Taxes help more people with lower socioeconomic backgrounds because their buying power is lower (Krieger et al., 2021).

Taxes on sugary drinks have been adopted in many countries, including Finland, France, India, Mexico, Norway, the Philippines, Saudi Arabia, South Africa, Thailand, and the United States (Cawley et al., 2019). Tax policies on SSBs differ across countries, but the tax rate is mainly based on the sugar content in the beverage (Krieger et

al., 2021). Taxation has a good impact on both population health and the country's revenue (Cawley et al., 2019; Krieger et al., 2021). Because of the impact of COVID-19 on economies, stakeholders are more inclined to embrace tax policies nowadays, and taxes may help to rebuild the economy (Krieger et al., 2021).

Raising Awareness

Knowing the benefits of lowering sugary beverage consumption will encourage children and adolescents to limit their intake. A range of interventions is available to increase children's and adolescents' knowledge of the consequences of excessive sugary beverage intake. The first approach is to develop a school-based intervention that involves a public awareness campaign and a challenge in the consumption of SSBs. Smith & Holloman (2014) observed that students' SSB consumption was lowered when they were educated on the advantages of limiting the intake of SSBs and given a 30-day challenge to do so. Another strategy to increase children and adolescents' awareness is by presenting graphical caloric information regarding sugary drinks on a store's beverage refrigerator. According to Bleich et al. (2014), giving caloric information to adolescents lowered the overall amount of beverage calories consumed as well as the chance of buying SSBs.

Innovative slogans efficiently emphasise the harmful consequences of SSB intake (Sundborn et al., 2014). Bleich et al. (2014), for example, calculated how many minutes and miles of jogging and walking were necessary to burn off the calories in a sweetened beverage. Because adopting a particular written language (e.g., English) causes injustice for individuals who do not comprehend the language, visualising information regarding sugary beverages may reach a large number of people (Krieger et al., 2021). Moreover, labelling SSBs with different colours based on their sugar content (red for high sugar, yellow for low sugar, and green for non-sugary beverage) might help children consume less sugary drinks (Hartigan et al., 2017). This labelling technique, however, must be combined with improving people's understanding and awareness of the risks of consuming too many SSBs.

In addition to children and adolescents, parents, who have a significant role in their children's SSB intake, must be included as a target audience for this approach. Strategies to increase children's and adolescent awareness should be conducted at the family and community levels. The sugary drink intervention may be initiated by society or imposed by the government or another institution, such as a school, restaurant, or hospital, and many more. The institution's dedication to continue executing this approach and measuring its effect is the most critical part, since increasing people's awareness requires time and work.

Institutional Changes

Policies on SSBs are usually enforced at the state or local level by the government as a stakeholder. While restaurants and beverage shops desire to profit from the sale of sweetened drinks, the government is responsible for preserving the public's health. For example, in New York, the city government mandated that every beverage sold in vending machines in schools, elder centers, homeless shelters, public and private hospitals, correctional facilities, and other venues have no more than 25 calories per eight ounces. As a result of this rule, the beverage sector is encouraged to make adjustments to its products to make them less sweet and lower in calories (Kansagra et al., 2015).

Another strategy to reduce sugary drink consumption can be implemented in locations where children and adolescents spend time, such as schools, public spaces,

restaurants, and other places. Several studies propose alternative approaches to encourage healthier drinks, such as having non-sugar sweetened choices or even entirely unsweetened beverages accessible, as well as restricting unhealthy products (Monge-Rojas et al., 2020; Sundborn et al., 2014). Fast-food restaurants that formerly provided SSBs may be encouraged to convert to non-sweetened drinks, especially for children and adolescents, as a response to the policy (Krieger et al., 2021).

Similar to tobacco intervention, developing policies to reduce SSB intake takes a large amount of time and effort to design several policies at various levels. Coordination between local and national policies, as well as a community campaign, will be necessary instead of a single policy. This initiative will deliver a clear and direct message about the consequences of excessive SSB intake to stakeholders, the beverage business, and the broader population (Krieger et al., 2021). Mexico, for example, introduced several reforms around the same period. An SSBs awareness campaign, efforts to enhance the availability of potable water, restricting SSBs advertising to minors, and regulating harmful drinks in schools are all being adopted to decrease SSB use and promote public health (Cawley et al., 2019). However, developing strategies to limit SSB consumption is a complex process that requires sufficient evidence and cannot be accomplished in a short period.

Conclusion

Since children and adolescents consume a greater proportion of sugary beverages than other age groups, they are more susceptible to develop the negative health consequences of SSBs. Excessive use of SSBs has been related to obesity and unhealthy weight gain in several studies. Moreover, obesity rates in children are growing quicker than in other age groups. Obese children will grow up to become obese adults who may acquire one of the NCDs associated with obesity, such as hypertension, cardiovascular disease, heart disease, stroke, and type 2 diabetes. As a result, restricting sugary drink intake among children and adolescents is crucial for promoting population health and minimising future disease burden.

Children and adolescents, on the other hand, are harder to convince to limit their consumption of SSBs. Sugary drinks are popular among children and adolescents because they think that consuming sugary beverages helps them feel better and more energised. Furthermore, parents and the home environment are associated to children and adolescents' SSB intake since the characteristics of parents and the availability of sugary drinks at home have a major impact on their consuming behaviour. Furthermore, due to a conflict of interest between the beverage business and the government, implementing health regulations relating to sugary beverages is challenging. Moreover, temporal delays between policy implementation and health outcomes make several parties questioning the value of lowering SSBs consumption among children and adolescents.

For the policies, several countries, including Mexico, the United States, New Zealand, and others, have effectively limited SSB consumption by enacting multiple policies at the same time. In some countries, a variety of strategies have been employed to raise SSBs pricing, promote public awareness of the detrimental consequences of excessive SSB intake, and expand the availability of healthier drinks. To minimise SSB intake among children and adolescents, a single policy will not be sufficient. Several efforts must be taken at the same time to reach out to more people with the various socioeconomic condition.

While several researchers have looked at various aspects of SSB use in Indonesia, still needs further studies on

SSB consumption among adolescents and children. It might address issues such as the relationship between SSB intake and bad health consequences, regional disparities in SSB consumption, and the factors that influence SSB consumption among Indonesian children and adolescents. To establish appropriate policies and methods to avoid excessive SSB intake among Indonesian children and adolescents, there is also an opportunity to adapt and evaluate other countries' interventions on SSB consumption. Experimental studies or pilot projects targeting Indonesian children and adolescents may be undertaken in schools or other settings.

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