

Focus on Potential Health Benefits when using Natural Sweeteners in Place of Refined Sugar

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Abstract: *Sugarcane (70%) or sugar beet (30%) are the sources of sucrose, which is found in 99% of refined sugar, a processed product. In contemporary countries, sugar is still an important part of the diet and is valued for both its flavour and unique sweetening capabilities as well as its role in food preservation. On the other hand, a high intake of refined sugar is linked to various health problems, including a high risk of dental cavities, being overweight, and neuro developmental abnormalities in children, as well as non-communicable diseases. Due to their nutraceutical characteristics, alternatives like unrefined sugars have attracted a lot of interest as a healthy option. This essay aims to discuss the health benefits of sugar generated from natural sources and to identify potential health issues that may result.*

Keywords: Non-communicable diseases, food preservation, Refined sugar replacement, Natural sweetener, and Health benefits.

I. INTRODUCTION

Numerous cuisine cultures now cannot imagine meals without sugar. Along with being a crucial component in the creation of many sweets, sugar also serves as a preservative, a bulking agent, a texturizer, a moisturizer, a dispersant, a stabilizer, a substrate for fermentation, a flavour carrier, and a browning and decorative agent in food (Manickvasagan et al., 2017). Mono- and di-saccharides are referred to as "sugars" in terms of chemical classification. The three main monosaccharides (six-carbon sugars) that make up naturally occurring di-, oligo-, and polysaccharides are glucose, fructose, and galactose (Fidler Mis et al., 2017). Table sugar, also known as sucrose, is composed of glucose and fructose units and is referred to as "sugar" (Sachdev, 2018). Reducing sugars are defined as those that have a carbonyl group that is "exposed" as opposed to asnon-reducingsugars(sucrose)(Clemensetal.,2016).

Sugars are naturally found in foods such milk, fruits, and vegetables, but they are also added while the food is being prepared, processed, or served (Jomaa et al., 2021). Natural sugars found in whole foods are a crucial part of a balanced, nutritious diet. According to Fidler Mis et al. (2017), added sugars increase calorie intake, the sensory impact of meals, and overall satisfaction but are not necessary for a balanced diet and optimum health. By providing calories without other vital components like vitamins, minerals, or other essential elements, they can replace nutrient-dense diets and result in poor health consequences (Slavin, 2012). AccordingtotheWHO,naturallyoccurrencesugars,knownasintrinsic sugars, are naturally incorporated within intact plant cell walls(FidlerMisetal.,2017). Strong worries about excessive sugar consumption and its impact on health have been voiced in recent years. The world's sugar consumption has tripled during the past fifty years. According to the global sugar glut, added sugar alone accounts for more than 500 calories consumed daily on average across the globe (Lustig et al., 2012). The use of processed and calorically sweetened foods and beverages, especially table sugar, a type of refined sugar, is the cause of this excessive calorie intake (Makarem et al., 2018). However, according to the majority of available statistics, sugar consumption is higher than what is advised (Edwards et al., 2016). The WHO suggests limiting added sugar consumption to no more than 10% of total energy (Organization, 2003). According to Manickvasagan et al. (2017), the USDA food guide suggests consuming added sugar in amounts between 6 and 10% of total energy. One of the oldest sweetening agents and the most used caloric sweetener, both for domestic and commercial use, is table sugar. Sucrose is typically used in crystal or refined form. According to Gerschenson et al. (2017), this white refined sugar is industrially made from sugar beet or sugarcane. After sugarcane juice is extracted,

purified, evaporated, and crystallized, it goes through several phases of refinement where it may lose some minerals. Then, additives such as clarifiers and preservatives are added, which remain in the products and decrease the nutritional quality. White crystal sugar can be refined into white refined sugar, which has grains that dissolve easily in beverages and other preparations. Chemical additives, such as sulphur, are used during processing to make it whiter (Curi et al., 2017). The impurity of white refined sugar is typically caused by chemicals used in large-scale production and refining, such as calcium hydroxide $\text{Ca}(\text{OH})_2$, lime (CaO), phosphoric acid, bleaching and decolouring agents of variable quantities and consistency (Sadjadi et al., 2018). Refined, added sugars have similar effects on habit formation as traditional substances of abuse like coffee, alcohol, tobacco, and cocaine. It has been demonstrated that foods with a high sugar content produce medications with psychedelic properties. The most extensively utilized sugar addition techniques today are sucrose and high-fructose corn syrup. In addition, the extraction and refinement processes used to create refined sugar are identical to those used to create cocaine from coca leaves (Di Nicolantonio et al., 2018). The goal of this review is to draw attention to the necessity of limiting or eliminating the consumption of refined sugar in daily life, which is associated with a number of health problems, and to highlight the potential health advantages that may result from naturally occurring sugars.

A root of illnesses and problems is too much sugar.

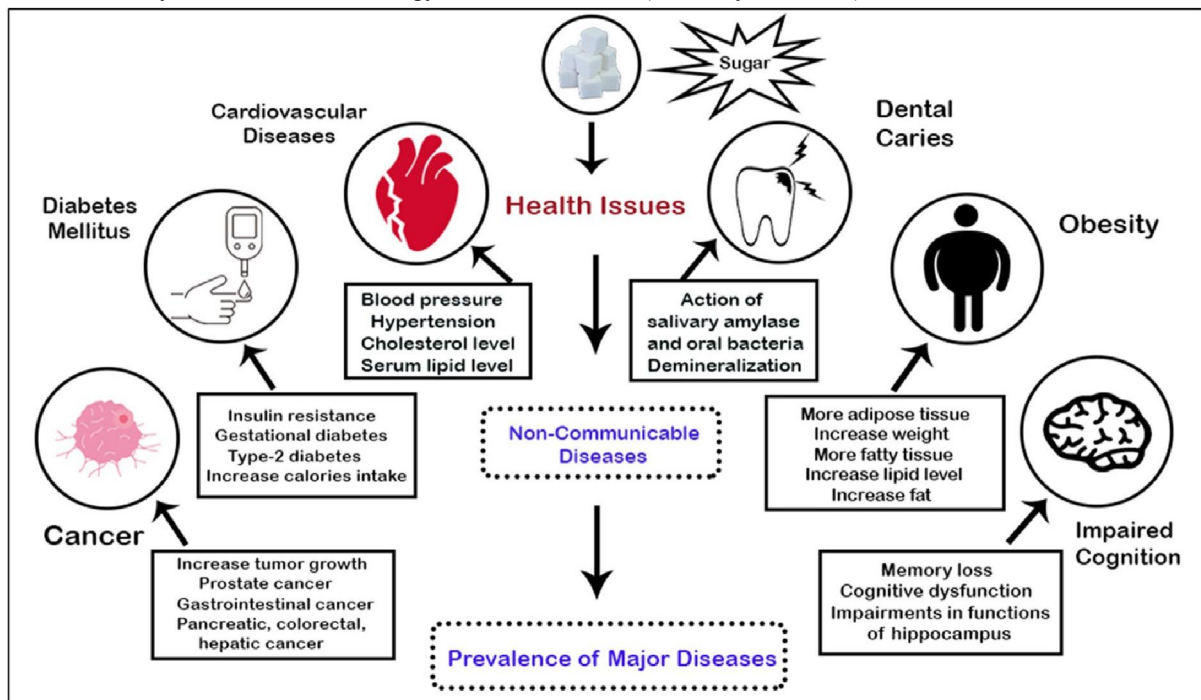
Sugar consumption is a significant public health issue that has become more widely recognized in recent years among people of all ages. A surplus of dietary sugar increases the risk of metabolic disorders like obesity and diabetes as well as cardiovascular diseases. Numerous epidemiological studies and clinical trials have linked excessive consumption of sugar-sweetened beverages—one of the main sources of dietary sugar—to weight gain, poor dental health, cancer, metabolic syndrome, heart disease, and type 2 diabetes mellitus in numerous nations (Kartinen et al., 2017). Figure 1 illustrates the mechanisms underlying several serious health issues brought on by consuming refined sugar.

Oral health conditions

According to the 2016 Global Burden of Disease Study, oral disorders affect 50 percent of the world's population. Oral sickness can begin as early as 18 months of age and can occur at any stage of life. Oral health is a neglected area of global health; according to Fisher et al. (2018), 2.3 billion individuals worldwide have permanent tooth decay and more than 560 million children have primary tooth decay. Untreated oral disorders are the obvious indicator of health inequalities in the population, and oral health inequalities and poor oral health have economic and social impacts on people (Ravaghi et al., 2013). In the Sustainable Development Goal 3 (SDG 3), oral disorders are seen as comorbidity factors, along with sexual and reproductive health, maternity and infant health, and infectious and non-communicable diseases (Fisher et al., 2018). Additionally, oral health issues have a negative impact on academic performance and the learning process. Untreated dental caries that result in oral pain or infection are likely to cause children to miss school (Karki et al., 2019). Recent systematic reviews have reported on numerous instances of children who exhibit poor academic performance, low attendance, and high dental caries rates (Rebelo et al., 2019; Ruff et al., 2019).

Dental caries is the most common disease included in the Global Burden of Disease Report 2015, ranking top for permanent teeth decay. It is a significant public health issue around the world. The most prevalent chronic non-communicable disease, dental caries, affects people of all ages, from young toddlers to elderly people. Dental caries affects 80% of the world's population and dietary sugar is the most substantial risk factor for dental caries (Moynihan, 2016). Consuming sucrose (table sugar) and fermentable carbohydrates causes bacteria in the mouth to break down the sugars into acids, which may demineralize the hard structures of the teeth. This process is known as caries. Dental caries is more prevalent in people who consume more free sugar (Hujoel and Lingstrom, 2017; Organization, 2017). Since most children at the time had oral decay, it was discovered in the 19th century that limiting sugar could avoid dental issues. In addition to increasing the risk of dental caries, sugar is known to increase the risk of gingival bleeding (Hujoel and Lingstrom, 2017). A study demonstrated the impact of a diet adjusted for dental health on periodontal and gingival inflammation. For four weeks, members of the experimental group were required to follow a diet that was low in carbs, high in Omega-3 fatty acids, vitamin C, antioxidants, and fiber, whereas members of the control group underwent no dietary adjustments. According to the findings (Woelber et al., 2017), a diet low in

carbohydrates, high in Omega-3 fatty acids, vitamins C, and fiber can significantly lower periodontal and gingival inflammation. According to a study, limiting sugar consumption and implementing other nutrition policies at schools may improve kids' oral health and reduce the expenditures associated with dental caries. To determine the effect of dietary sugar in the emergence of caries, an observational cross-sectional experiment was conducted. A questionnaire, 24-hour dietary recall interviews, and a clinical examination of 128 patients between the ages of 11 and 12 were used to collect the data. Through dietary assessment, free sugar consumption before bed and in between meals was evaluated. This study's findings suggested that eating sweets right before bed may be a substantial risk factor for dental caries (Goodwin et al., 2017). Sugar consumption is thought to be a major risk factor for the development of dental caries, which is also likely to influence the etiology of rheumatic fever (Thornley et al., 2017).



Illnesses that are not contagious

56 million people die each year in the world, and non-communicable diseases (NCD) are to blame for 38 million of those (68%) deaths, 16 million of which (more than 40%) occurred prematurely (before the age of 70). 52 million deaths from NCDs are anticipated to occur each year by 2030. NCDs are under increasing pressure, which makes it more difficult for both households and the government to pay for healthcare. Additionally affecting health and health-related behavior, this economic pressure lowers quality of life (Jan et al., 2018). An increase in NCDs has been linked to sugar consumption. According to Lustig et al. (2012), sugar's effects on the body can be comparable to those of alcohol. According to Manickavasagan et al. (2013), increased sugar consumption may raise the risk of obesity, diabetes mellitus, cardiovascular illnesses, hypertension, cancer, and glucose intolerance. Foods containing a lot of sugar provide little essential nutrients and dietary fibers, only empty calories. In addition to replacing nutrient-dense diets, these foods cause both overeating and under nutrition in humans (Steele et al., 2016). As indicated in **Table 1**, numerous research have found that using added sugar excessively raises the risk of heart disease, type 2 diabetes, high blood pressure, high cholesterol, and other conditions.

Epidemiologic research has repeatedly linked sugar and its compounds to greater rates of obesity, diabetes, and metabolic syndrome—all of which are major risk factors for the development of cancer. Increased sugar consumption causes blood sugar to rise, which then causes insulin-like growth factor 1 to rise as well, which causes inflammation, obesity, and an increase in oxidative stress, which increases the risk of cancer (Makarem et al., 2018).

Due to their significance in the growth of cancer cells, refined carbohydrates are regarded as the main nutrients that cause cancer. (2018) Makarem et al. A systematic review of 37 prospective cohort studies found in PubMed, Embase,

and CINAHL found a connection between dietary sugars and the risk of cancer. In almost 15 research, the risk of cancer was linked to total sugar intake, sucrose and fructose intake, added sugar intake, and sugary foods and drinks. In 2–5 studies, the risk of cancer was found to be between 60–95% and in 8–15 studies, it was shown to be between 23–200%. Dietary sugars have been connected to several lifestyle-related malignancies, such as female cancers (breast, endometrial, and ovarian), prostate cancer, gastrointestinal cancers (pancreatic, colorectal, hepatic, and biliary tract), and hematologic cancers (lymphoma, etc.).

Table 2. Studies demonstrate the link between excessive sugar consumption and non-communicable diseases.

Study	Results	References
In rats, drinking water was replaced with an 8% sucrose solution, and tachycardia and hypertension appeared after a week.	This research in animals shown a clear correlation between consumption of highly refined sugar and the development of arterial hypertension.	(Goranetal.,2013)
An online poll with 2496 individuals from various nations included questions regarding soft drink use, the existence or absence of particular diseases, physical activity, and medicines.	People who drink more cola soft drinks are more likely to have obesity, gastritis, constipation, and mental disease.	(Martinetal.,2018)
Few prospective studies have looked at the relationship between added sugar consumption and cardiovascular disease-related deaths.	Many adults in the US consume more added sugar than is recommended for a healthy diet, and studies have linked added sugar consumption to a lower risk of dying from cardiovascular diseases.	(Yangetal.,2014)
A meta-analysis of 10 prospective cohort studies includes six trials for type 2 diabetes mellitus, three for the metabolic syndrome, and one for coronary heart disease.	Evaluated the link between weight increase and the risk of cardio-metabolic disease and the intake of sugar-containing soft drinks.	(Bray,2013)

Biliary system disorder

Higher consumption of refined sugar is associated with a higher prevalence of gallstones, according to observational human research. Due to the fact that eating a lot of sugar can cause obesity, there may be a correlation between the consumption of refined sugar and gallstones (Sharma and Tandon, 2012). According to a study, eating foods high in processed carbohydrates, particularly refined sugar, increases the amount of bile cholesterol in the body and leads to the development of cholesterol gallstones. 13 people with cholesterol gallstones (10 women and 3 men) were given unrefined and refined carbohydrate diets to follow for six weeks each in order to test this theory. Following each diet, the duodenal bile's lipid composition and the kinetics of bile acid were assessed, and the findings showed that people on a processed carbohydrate diet had greater cholesterol concentrations. When refined carbs are consumed, bile cholesterol levels rise. Refined carbohydrate diets may reduce the development of gallstones (Di Ciaula et al., 2019). It is important for those who are at risk of developing gallstones to avoid consuming inappropriate amounts of refined sugar, even though it has not been established that doing so promotes the formation of gallstones (Sharma and Tandon, 2012).

Children's neuro developmental problems.

A neurological condition known as Attention Deficit Hyperactivity Disorder (ADHD) is characterized by enduring signs of hyperactivity, inattention, and impulsivity. Childhood-onset ADHD frequently persists into adulthood, impairing academic achievement as well as other lifelong losses including interpersonal and familial conflicts. Numerous studies have demonstrated that diets heavy in processed sugar and saturated fat can increase the risk of hyperactivity or ADHD (Del-Ponte et al., 2019). In a cohort research, Howard et al. (2011) found that adolescents who scored well on a western diet that was high in saturated fat and refined carbohydrates were most likely to experience ADHD symptoms. Abbasi et al. (2019) and Peacock et al. (2011) both demonstrated that high that high sugar and fat diet increases the risk of ADHD.

It is maintained by the widespread misconception that refined sweets cause hyperactivity. There are two theories supporting it: the first is that certain children experience "true reactive hypoglycemia" after consuming sugar, and the other is that hyperactivity is caused by an allergy to refined sugar. Although studies on rats suggest that sugar dependence contributes to behavioral and neural changes that affect the dopamine system in a similar way to how it is affected during stimulant sensitization, there have been no recent studies on the relationship between sugar and behavior in children.

Pregnancy complications

A nutritional diet is crucial for the mother's and fetus's best health while she is pregnant. The number one characteristic of an unhealthy diet is excessive sugar consumption since these meals frequently substitute better ones that include important macro- and micronutrients and save calories. Consuming sugar is associated with a higher risk of developing preeclampsia, gaining too much weight during pregnancy, and developing gestational diabetes mellitus in the mother. According to Graham et al. (2013), each of these variables may increase the risk of perinatal death and morbidity as well as issues during pregnancy. Drinking sugar-containing beverages when expecting a child is positively associated with the child's early childhood body mass index, notably with increased fat mass. Another study was carried out to examine the impact of sugar-sweetened cola beverages during pregnancy, and the findings revealed a relationship between high daily consumption of these drinks and a rise in preterm birth rates (Petherick et al., 2014).

According to research on pregnant women's sugar consumption habits, initiatives to support them in eating a balanced diet and cutting back on sugar intake should be based on nutritional education and nutritional awareness. (2013) (Graham et al., 2013).

Natural sources of sugar

Demand for low-calorie products has increased as a result of the public's growing interest in health and welfare (Manickvasagan et al., 2017). Because of this, numerous discoveries have concentrated on finding ways to replace refined sugar (table sugar) with natural sugars that can be used in solid, semi-solid, and liquid culinary applications. Unrefined sugar contains a range of bioactive substances, minerals, fibers, antioxidants, and phytochemicals that aid to reduce inflammation and improve endothelial function. The level of purification has an impact on the nutritional qualities and antioxidant potential of sugars. Due to their increased phenol and flavonoid content, unrefined sugars may have a favorable nutritional impact when used in place of refined sugars, according to studies (Lee).

Numerous research have emphasized the possible advantages of unrefined sugars' antioxidant action. For instance, adult research found an unfavorable relationship between naturally occurring carbohydrates and weight increase (Fidler Mis et al., 2017). In Figure 2, further advantages of natural sweeteners are displayed. Consumer interest in eating healthier meals is increasing as a result of growing health concerns among consumers. In this situation, it has been necessary to substitute traditional white sugar with more natural, healthier sugars (Curi et al., 2017). As a result, natural sugar is preferred because research has shown that it offers greater health advantages than refined sugar. Alternative sources of sugar include numerous plant-based sources. Additionally, all plant-based sources offer additional nutritional value in addition to supplying empty calories, and they may even help prevent some diseases. The following are some well-known natural sweeteners that can be used in place of refined sugar:

Palm dates

There are numerous significant bioactive components in dates. Dates have been consumed and grown since ancient times in Africa and the Middle East. There are roughly 5000 different date palm kinds in the world, and they vary from one another in terms of nutrient content, genetics, and morphology. Given that it may be used as a source of raw materials for a variety of cuisines, *Phoenix dactylifera*, also known as the date palm, is regarded as the most significant socioeconomic tree among all species. The two main sugars found in dates, glucose and fructose, are excellent sources of carbohydrates (Shehzad et al., 2021).

The use of dates in place of refined sugar is growing. Producing date fruit syrup with the intention of using it to replace sucrose in food products has a lot of potential. According to research, dates have a significant positive impact on human health, as seen in Table 2. According to El-Sharnouby et al. (2014), dates have 10–20% moisture by dry weight, 60–75% total sugars, almost 2% protein, 5–8% fiber, and less than 1% fat.

Grapes

A fruit crop with great economic value is grapes. During the 2018/2019 growing season, the world produced roughly 22.15 million metric tons of grapes. While some grapes are used to manufacture raisins, the majority of the grape harvest is utilized to make wine and is also consumed as fresh fruit (Lee and Sumner, 2015). Typically, Fresh grape juice usually consists of water (70–80%) and many dissolved solids that are composed of many organic and inorganic compounds. Sugars, organic acids, phenolic compounds, minerals, and pectin substances are the key compound groups for winemaking (Tarko et al., 2014). Grapes contain a significant amount of carbohydrates, including glucose and fructose. Ripe grapes have a sugar content that ranges from 150 to 250 g/L. Glucose is the primary sugar in unripe grapes. According to Jones and Goodrich (2008), fructose and glucose are present in identical amounts during the ripening stage (1:1 ratio), however the concentration of fructose in overripe grapes is higher than that of glucose. The ratio of fructose to glucose in ripe grapes varies slightly between grape varieties. Fructose is the sweetest of the three sugars, with glucose and sucrose having varying degrees of sweetness. In order to produce the same sweetness, less fructose than sucrose is required (Shiraishi et al., 2010).

Sucrose beet

The roots of the sugar beet plant have a higher percentage of sucrose. It is planted for commercial purposes in order to make sugar. The sugar beet has a conical, slender, fleshy root system and a flat crown. The plant consists of a root and a rosette of leaves. Through the process of photosynthesis, sugar is made in the leaves and subsequently builds up in the roots. According to Ahmad et al. (2012), the beetroot comprises 75% water, 20% sugars (between 12 and 21% depending on the cultivar), and 5% pulp. Cellulose, hemicellulose, lignin, and pectin make up the majority of the pulp. It can be utilized in animal feed and is insoluble in water. 10% more of the harvest value comes from by-products of the sugar beet crop such pulp and molasses (Habeeb et al., 2017)

Sugarcane

The main source of sweeteners (90%) is sugarcane. The height of sugar cane can reach 4.5 meters. It belongs to the grass family and has six species: *S. Officinarum*, *S. Barberi*, *S. Sinense*, *S. Robustum*, *S. Spontaneum*, and *S. elude* (Kocher et al., 2014). It is connected to the genus *Saccharin*. Sugarcane is a key raw resource used by agro processing businesses to make a range of sugars, jaggery, and Khandsari. About 70% of the world's jaggery is produced in India, which also contributes to the biggest amount of sugar production (Said and Pradhan, 2013). Jaggery and Khandsari were made from sugarcane (approximately 37.2%) (Nath et al., 2015). For a very long time, sugarcane was known and grown as a vital source of sugar and ethanol. Although sugarcane was used as medicine in the subtropics and tropics where it is grown, sugarcane is mostly prized in Europe and North America for its sweet flavor.

According to Ayurveda medicine, sugarcane can treat a variety of health issues including the flu, constipation, cough, anemia, bronchitis, jaundice, general weakness, and blood abnormalities (Edwards et al., 2016). Although traditional Indian medical systems have long recognized sugarcane as a therapy for septic shock and a number of other ailments, the medical significance of sugarcane is less understood outside of India (Ji et al., 2019). Several phytochemicals, including polyphenolic substances like phenolic acids and juices, as well as different glycosides and their byproducts

(like molasses), have been identified in sugarcane by recent pharmacological research. Sugarcane has increased interest in nutraceutical goods recently. Numerous research have shown that sugarcane extracts in vivo models have beneficial benefits on the immune system, liver injury prevention, intestinal functioning recovery, protection against various infections, anti-stress results, and development stimulation (Edwards et al., 2016).

Additionally, sugarcane has potent antioxidant properties and is important for maintaining health because it is thought that many human diseases, including cancer, cardiovascular disease, and other degenerative disorders, are brought on by oxidative damage (Segu et al., 2015). The anti-oxidant properties of sugarcane are often brought on by phenolic substances, including flavonoids, phenolic acids, and polyphenols. It is believed that phenolic dietary components, especially flavonoids, may benefit human health. However, because these chemicals are undesired in the production of sugar, they are removed from juice during processing (Arif et al., 2019; Khan et al., 2021; Zia et al., 2019). The Maillard reactions that take place during production of some sugarcane products, such molasses, may give them antioxidant effects. Both raw sugarcane and molasses have been shown to have antioxidant effects by a number of researches (Singh et al., 2015). The ability to combat free radicals, suppress lipid peroxidation, and protect against oxidative and proliferative activity against cancer cell lines were among the beneficial characteristics noted (Abbas et al., 2014).

Jaggery

Jaggery, also known as gur, is a natural sweetener made by condensing sugarcane juice into a solid or semi-solid form, either with or without prior juice purification or the use of any artificial additives, chemicals, or preservatives. Gur is consumed throughout the subcontinent and is referred to as the poor man's sugar (Gartaula and Bhattarai, 2014). Jaggery is considered a food ingredient because it contains a lot of energy, minerals, and vitamins. It can be used as a sweetener on its own or in a variety of dishes, such as animal feed mixtures. For instance, during the winter in the sugarcane region, farmers fed jaggery cake to pigs. A good source of extraordinary energy and minerals is the jaggery filter cake. One of the oldest sweets known to man is jaggery, which is a staple of the diet in many nations like India, particularly in rural areas. Jaggery comes in three different forms: solid, liquid, and granular (Said and Pradhan, 2013; Singh et al., 2013). The micronutrients in jaggery have a wide range of therapeutic and nutritional effects, including anti-carcinogenic and anti-toxic action. A sugarcane product called jaggery is incredibly rich in vitamins and minerals. The most prevalent vitamin in jaggery is vitamin A (3.8 mg), vitamin D2 (6.5 mg), vitamin C (7 mg), and vitamin. Sodium (19–30 mg), Calcium (40–100 mg), Magnesium (70–90 mg), Potassium (10–56 mg), Phosphorus (20–90 mg), and Phosphorus (20–90 mg) are other significant minerals in jaggery. Chloride (5.3 mg), Copper (0.1-0.9 mg), Zinc (0.2-0.4 mg), Manganese (0.2-0.5 mg), and Iron (10-13 mg) (Singh et al., 2013). Because it provides rapid energy and prevents insulin resistance, abdominal obesity, and other chronic diseases, jaggery has been shown to be more beneficial than sugar (Mahalaxmi and Hemalatha, 2018). The preparation of numerous sweet foods, including candies, toffees, jaggery cakes, and other related sweet meals like Payasam, Obbatu (Holige), and Unday, typically uses jaggery, which is widely utilized in the cuisines of the Indian subcontinent (Jaffe, 2012).

Honey

A complex mixture makes up the naturally occurring sweetener called honey. There are around 200 parts in total, the majority of which are sugars (75% of which are monosaccharides and 10-15% of which are disaccharides with traces of other sugars). Water, enzymes, proteins, phenols, vitamins (particularly B vitamins), minerals, organic acids, and solid particles from harvesting are other components. Honey contains roughly 30% glucose and more than 38% fructose. Early harvesting may indicate that sucrose was not completely converted into fructose and glucose, whereas high sucrose levels may indicate the presence of some adulterants and inexpensive sweeteners (de Silva et al., 2016).

Honey has been utilized for medical purposes for a very long time. Apitherapy is a field of medicine that uses bee products, such as honey, to treat a variety of illnesses. According to studies, honey can be used as a preventative measure for diseases caused by oxidative stress, such as cancer, diabetes, hepatic and renal failure, and aging. Based on hue, there are three main kinds of honey: light, amber, and dark. The color, fragrance, composition and flavor of honey are chiefly dependent upon the flowers, geographic regions, processing, handling, packing, storage time, climate and species of honeybee involved in its production (Escuredo et al., 2014).

According to the findings of numerous research, honey may be a potential anti-obesity agent that aids in the management of obesity and overweight. According to data from human research, honey decreased subjects' body weight, body fat, and cholesterol. Consuming honey decreased triglycerides and LDL: low-density lipoprotein cholesterol while modestly increasing HDL: high-density lipoprotein cholesterol, according to another study on overweight participants (Samat et al., 2017). Table 3 lists a few advantages of natural sweeteners.

II. CONCLUSION

Refined sugar is frequently used in our daily lives, and utilization has multiplied over the past few decades. Every home in the world uses it frequently in sweets, tea, milk, juices, shakes, and bakery goods. But it poses a serious threat to people's health. The discoloration and other extraction and preparation processes include the use of numerous chemical additions, some of which can be dangerous. Numerous health issues, such as obesity, the metabolic syndrome, diabetes, dental caries, raised cholesterol, high blood pressure, and possibly even cancer, have been linked to sugar. Additionally, it may contribute to insulin resistance and poor glucose tolerance, both of which have been linked to cognitive decline, negatively impacting the brain. Additionally, it may lead to pregnancy difficulties. Therefore, a number of strategies have been put up to prevent these health issues by limiting the use of sugar and so substituting healthier dietary options. Natural sweeteners including honey, date palm, jaggery, sugar beet, sugarcane, sorghum, and grape sugar are the best in this regard. These natural goods contain a lot of vitamins, minerals, phytochemicals, antioxidizing agents, and other beneficial compounds in addition to their high natural sugar content. In addition to serving as sweeteners, these natural compounds support the body's overall health and gut wellness. Some of these organic ingredients have also been utilized for medical treatment for a longer period of time. These substitutes for sugar that are used as sweeteners offer more health advantages than sugar while posing no risk to human health.

Sugar consumption has dramatically increased in recent years as a result of modern lifestyles and alterations in consumer eating patterns. Future research should look into more practical and effective ways to employ these natural sweeteners in place of refined sugars on a regular basis. The issue may be that many people find it difficult to afford certain food items because they are often not inexpensive. In order for consumers to easily take advantage of these products, they must be made readily available in affordable, convenient formats. Governments can take action in this regard by setting up public awareness campaigns and seminars, particularly in underprivileged regions, to warn citizens about the risks to their health posed by consuming excessive amounts of refined sugar while highlighting the benefits of sugars derived from natural sources.

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