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Developing a Counseling Aid for General Public Regarding Over Consumption of Sugar-Sweetened Beverages

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Abstract

Several studies and survey repots have shown the daily dietary intake of sugar among Indian population is rising day by day. Sugar today is a relevant ingredient in many food and beverage products. The beverage market today hosts an abundance of sugar sweetened beverages, including a wide range of packaged fruit juices. Sugar-sweetened beverages provide little nutritional benefit and amplify weight gain and probably the risk of diabetes, fractures, and dental caries, as they are loaded with large amount of sugars, therefore it is very important to create awareness among general public regarding the amount of excessive sugars present in these beverages which is unknowingly consumed. The present study was undertaken with the objective of developing a counseling aid for general public regarding overconsumption of Sugar-Sweetened Beverages. The counseling aid – A ready rekoner(Information booklet) was developed using laboratory values obtained by estimating sugar content in various commonly available sugar sweetened beverages using the Lane-Eynon method.

Keywords: Sugar-Sweetened Beverages, Packaged Fruit Juices, Diabetes, BMI, Chronic Diseases, Consumption Pattern, Weight Gain Dental Caries.

Introduction

Sugar and humans have a long shared history. The transition from the formerly white gold to a common commodity, thought of as adverse for our health, is a result of industrialization. Sugar today is a relevant ingredient in many food and beverage products. Its concentration ranges from very small to high contents depending on the purpose of the sugar addition.

Sugars are a ubiquitous component of our food supply and are consumed as a naturally occurring component of a lot of foods and as add-ons to foods during processing, preparation, or at the table (Murphy and Johnson, 2003). However, harmful health effects may occur when sugars are consumed in large amounts.

Excess of sugary foods may lead to obesity and elevated blood lipids. For prevention of diet-related chronic diseases, sugars should be used sparingly (Dietary guidelines for Indians, NIN, 2012). NIN recommends about 20gm /d (4 teaspoons) or 100 calories of sugar intake for both men and women with sedentary lifestyle.**Sugar-sweetened beverages** (SSBs) are drinks sweetened with sugar, high-fructose corn syrup, or other caloric sweeteners, and include soft drinks, fruit drinks, iced tea, and energy and vitamin water drinks. Processed and packaged fruit juices have now become a permanent item in the household grocery purchase.

Soft drink consumption has been linked with higher energy intake, greater body weight, and poor nutrition (Vartanian and Schwartz, 2007) and excessive fructose consumption is known to play a role in the epidemics of insulin resistance, obesity, hypertension, dyslipidemia, and type 2 diabetes mellitus in humans (Dhingra et al, 2007)

The consumption of sugar-sweetened beverages has been linked and shown to increase the risks for obesity, diabetes, and heart disease; therefore, a compelling case can be made for the need for reduced consumption of these beverages (Malik et al, 2006; Vartanian et al, 2007). A direct association exist between adulthood overweight and BMI and an increase in consumption of sugar-sweetened soft drinks in young women (Nissinen et al, 2009).Regular consumption of SSBs is associated with a higher risk of Chronic heart disease in women, even after other unhealthy lifestyle or dietary factors are accounted for. (Fung et al, 2009).

Objective of the Study

Guidelines for recommended intake of sugars have been given, therefore it is very important for an individual to know how much of extra sugar unknowingly he/she is consuming via these beverages in their daily life. However there is a scarcity of awareness on nutritive quality (sugar content) of these beverages. The present study was undertaken with the objective of developing a counseling aid for general public regarding overconsumption of Sugar-Sweetened Beverages

Methodology

Laboratory Investigation

Selection of Beverages

The laboratory investigations were performed on selected fruit juices and beverages and carbonated drinks.The selection was based on highest saleability among other counterparts in the retail shops. As stated earlier this information was obtained from the retailer using a checklist to score the beverages from 1-3 depending on low, moderate and high sale. The name of the brand of packaged juices selected for investigation has not been revealed for reasons of confidentiality. Also the same flavours for fresh fruit juice category were selected to compare the results. In case of carbonated beverages the most saleable drinks were selected.

The selected beverages were divided into four categories:

Category 1

Packaged fruit beverages-

Flavours-

1. Mixed fruit
2. Orange
3. Apple
4. Pineapple

Category 2

Packaged 100% fruit juices-

1. Mixed fruit
2. Orange
3. Apple
4. Pineapple

Category 3

Fresh fruit juices-

1. Mixed fruit
2. Orange
3. Apple
4. Pineapple

Another reason for keeping the flavours in all the three categories of fruit beverages similar was to compare the results for total sugar content in each flavour.

Category 4

Carbonated drinks-

1. Cola soda A
2. Cola soda B
3. Diet cola A
4. Diet cola B
5. Orange soda

Chemical Technique

The Fehling- Soxhlet method (Lane – Eynon Method) was followed.(Ranganna,1984).The literature reviewed, indicated that the method mostly selected for sugar estimation was the Fehling- Soxhlet method. Hence the selection of this method for laboratory investigations was used and also logistics and availability of instruments in the laboratory was a prime criterion for selection.

Reagents

Fehling's A and B solutions, standard invert sugar solution,0.2 % Methlylene blue indicator, 45% Neutral lead acetate solution, 22% Potassium oxalate solution, phenolphthalein indicator, 1N NaOH, concentrated hydrochloric acid and solid sodium bicarbonate. 50ml of acid treated and neutralized sample was titrated against 10ml standardized Fehling's solution using 0.2% Methlylene blue indicator.

Preparation of a Ready Reckoner

Results obtained from laboratory investigations were converted to household measures and this information was used to prepare a ready reckoner for promotion of a low sugar lifestyle.

Results

Sugar Content in Terms of Household Measures

Laboratory values obtained by the investigator were converted into calories and household measures (teaspoons). The results are depicted in table 1.

Table 1: Sugar Content in Terms of Household Measures

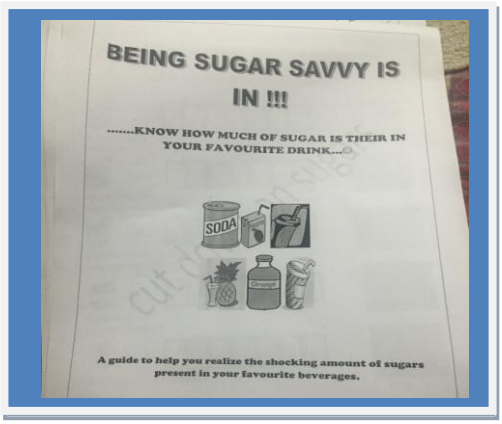
Sample	Amount (ml)	Sugar (gms)	Calories from Sugar	Sugar (tsp) 1 tsp= 5gm
Packaged orange juice	250	32.50	130	6.5
Packaged apple juice	250	40	160	8
Packaged pineapplejuice	250	34.1	136	7
Packaged mixedfruitjuice	250	33.82	135	7
Sample	**Amount (ml)**	**Sugar (gms)**	**Calories from Sugar**	**Sugar (tsp) 1 tsp= 5gm**
Packaged 100%applejue	250	29.97	119	6
Packaged100% pineapple juice	250	33.82	135	7
Packaged 100% mixed fruit juice	250	30.05	120	6

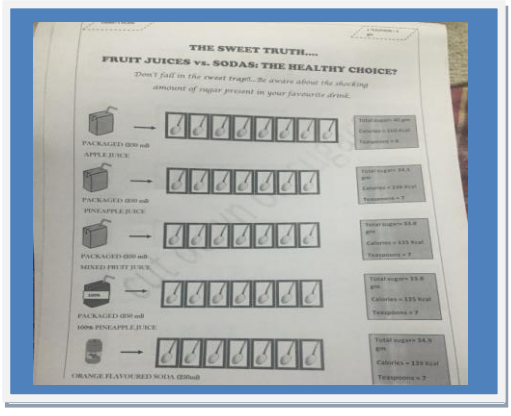
Freshlyextractedorangejuice	250	17.52	70	3.5
Freshly extracted apple juice	250	21.75	87	4
Freshly extracted pineapplejuice	250	23.42	93	5
Freshly extracted mixedfruitjuice	250	21.27	85	4
Cola soda A	250	29.55	118	6
Cola soda B	250	29.70	118	6
Orange soda	250	34.95	139	7
Diet Cola A	250	0	0	0
Diet Cola B	250	0	0	0

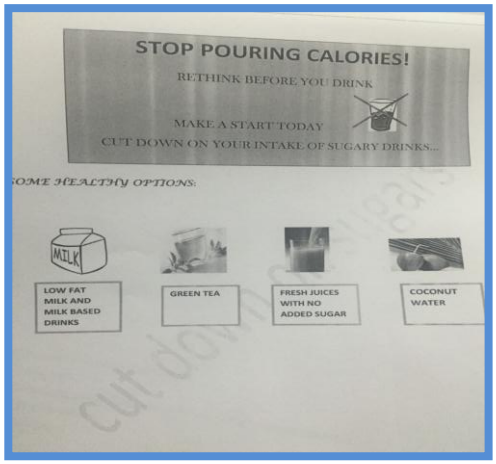
As shown in the table 1, packaged apple contained the maximum amount of sugar .i.e. 8 teaspoons in 250 ml of the beverage. The healthiest choice that emerged was freshly extracted orange juice that contained approximately, 3 teaspoons of sugar in 250 ml of the beverage.

Based on these results a ready reckoner was prepared in order to promote healthy beverage choices.

The Pictures of Ready Rekoner (Information Booklet) Developed Using Laboratory is as Follows:







The information booklet developed was distributed among young college girls and was well appreciated by all the viewers. The booklet basically conveyed the amount of sugar present in commonly consumed sugar sweetened beverages and freshly extracted fruit juices , so that the consumer can calculate his/her daily sugar intake via these drinks. The amount of sugar in the selected drinks was estimated by the researcher in the Laboratory using the Lane –Eynon method for sugar estimation.

Conclusion

Awareness regarding the amount of excessive sugars present in these beverages which is unknowingly consumed is very important. Since sugar is addictive, the recommended allowance of 4 teaspoons of sugar is easily exceeded. For example an intake of 250ml of carbonated soda results in the intake of 6 teaspoons of sugar which is well above the recommended allowance. Thus it is evident that a regular consumption of sugar sweetened beverages should not be encouraged and should be replaced by other healthier options such as low fat milk, green tea etc, as it can cause weight changes and affect the BMI status of an individual which as can increase the risk for various chronic diseases such as diabetes and metabolic syndrome.

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