ORIGINAL RESEARCH PAPER

Volume-7 | Issue-1 | January-2018 | PRINT ISSN No 2277 - 8179

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

SELF REPORTED KNOWLEDGE, ATTITUDE AND CONSUMPTION OF SUGAR SWEETENED BEVERAGES AMONG UNDERGRADUATE DENTAL STUDENTS AT KIDS DENTAL COLLEGE, AMALAPURAM, ANDHRA PRADESH

Dental Science

Dr. Priyanka Gollapalli MDS, Senior Lecturer Dept. Of Public Health Dentistry, KIDS Dental College, Amalapuram.

Dr. Naveen Kumar Baratam M.D.S, reader Dept. of Public Health Dentistry GITAM Dental College & Hospital, Visakhapatnam.

Hyandavi Balla* Post Graduate Student Dept Of Oral Pathology and Microbiology GITAM Dental College and Hospital *Corresponding Author

ABSTRACT

Aims and Objectives: This study is to assess the knowledge, attitude and consumption of sugar sweetened beverages (SSBs) and its association with body mass index (BMI) among undergraduate dental students.

Materials and Methods: A cross sectional design was used and the study was conducted at KIDS Dental College. Undergraduate dental students (n= 344) registered in 2017 were invited to participate. A self administered questionnaire was used to elicit the necessary information. Data analysis included frequencies and correlations using Chi square tests. Statistical significance was set at $P < 0.05$.

Results: The response rate was 88% (301) and the mean age was 22.3 years. The majority were female (72%) and 70% of respondents had an acceptable level of knowledge on the types of SSBs and possible health conditions if consumed excessively. Almost half (46%) had a positive attitude toward the consumption of SSBs. Clinical students had a significantly higher level of knowledge compared to nonclinical students ($P= 0.03$). Those with poor knowledge and attitude consumed significantly more SSBs ($P< 0.01$) than those with higher levels of knowledge and attitude. Males were significantly more obese and overweight than females ($P< 0.01$). There was an association between the amount of sugar consumed from SSBs and the BMI.

Conclusions: The knowledge and attitude toward SSBs was acceptable. There was a significant correlation between the consumption of SSBs and the BMI.

KEYWORDS

Attitude, Knowledge, Sugar Sweetened Beverages (SSBs)

Introduction

Sugar-sweetened beverages (SSBs) are drinks with added sugar such as carbonated drinks, energy drinks, sport drinks and flavoured juice drinks. Studies have reported that the consumption of SSBs has increased in both developed and developing countries in the last three decades. The increase is evident in many developing countries where access to SSBs has grown concomitantly with rising rates of urbanization.[1] Excessive consumption of these drinks has been associated with negative health consequences such as nutrition-related chronic diseases like obesity, diabetes, hypertension, and coronary heart diseases.

An increased intake of free sugars together with a poor diet has also been shown to be associated with the initiation and progression of non-communicable diseases (NCDs). NCDs are the leading causes of death and were responsible for 38 million (68%) of the world's 56 million deaths in 2012. An additional concern is the association between the intake of free sugars and the prevalence of dental caries.[2]

SSBs are composed of energy-containing sweeteners such as sucrose, high-fructose corn syrup or fruit juice concentrates, all of which have essentially similar metabolic effects. SSBs are thought to lead to weight [gain] by virtue of high added sugar content, low satiety potential, and incomplete compensatory reduction in energy intake at subsequent meals after consumption of liquid calories leading to a positive energy balance.[3]

Some SSBs contain large amounts of fructose, which is known to increase serum uric acid levels which could lead to gout. A study reported that the risk of incident gout was 85% higher in people who consumed two or more servings of SSBs daily compared with those who consumed <1 serving monthly.[4]

The World Health Organization (WHO) recommends that intake of free sugars should not exceed 10% of the total energy,[5] while the American Heart Association (AHA) recommends a daily intake of 9 (37 g) and 6 (25 g) teaspoons of sugar for men and women, respectively.[6]

These groups of students were chosen as their follow up is relatively easy and tend to have easy access to SSBs. In addition, dental students have received enough lectures on nutrition and diet and offer dietary counselling to their patients on a regular basis.

The aim of the study is to assess the level of knowledge and attitude toward SSBs and determine the association between sugar consumption from SSBs and the Body Mass Index (BMI).

MATERIAL AND METHODS

A cross-sectional analytical study on undergraduate dental students of KIDS Dental College in 2017 was conducted. A total of 344 students were registered and all of them were invited to participate. Since all registered students were invited to participate, the sample was representative sample. Students were divided into clinical 3rd and 4th year students and non-clinical students 1st and 2nd year students.

A pretested, self-administered questionnaire was used to collect information on the sociodemographic characteristics, knowledge and attitude of the students with regard to the health implications of frequent/excessive consumption of SSBs and their consumption patterns.[1]

The students' height was recorded using measuring tape with least measurement of 1cm and weight was recorded using 'Krups' bathroom weighing machine with least measurement of 0.5kg and corrected for zero error every time before recording a new measurement. The BMI was calculated using the WHO guidelines and participants were classified as: "underweight" when the BMI was <18.50 kg/m^2, "normal weight" if the BMI was between 18.51 and 24.99 kg/m^2, "overweight" when the BMI was between 25.00 and 29.99 kg/m^2 and obese when BMI was >30 kg/m^2.[7]

To determine the students' knowledge on SSBs, they were asked to identify the SSBs from a list of drinks. They were also asked about the health effects and health conditions associated with excessive intake of SSBs. Their knowledge was then rated as acceptable if they scored 50% or more and poor if they scored below 49%.

To determine the students' attitude toward SSBs, they were asked about how they felt regarding SSBs. This included questions on

whether they would like being seen with SSBs, using SSBs while entertaining their friends and whether they considered SSBs as a good treat. The students were classified as having a positive attitude if they answered appropriately to these questions on their attitude. The scores were combined and a score of 50% or more was considered as having a positive attitude toward SSBs.

Habitual consumption pattern of SSBs was assessed using a validated Food Frequency Questionnaire (FFQ). Participants were asked to report on how often they consumed SSBs listed in the FFQ. The consumption pattern of five categories of SSBs including fruit juice, soft carbonated drinks, soda drinks, energy drinks and tea or coffee with added sugar was measured. The amount of sugar ingested from these SSBs was converted into teaspoons. Each teaspoon contains approximately 4 g of sugar, hence 330 ml of a SSB, which contains 35 g of sugar, has the equivalence of 8.75 teaspoons. The number of teaspoons consumed was divided into four categories for ease of analysis; 0 teaspoons, 1 to 4, between 5 and 9 and >10 daily.[1]

Data analysis was done with SPSS version 20. The Chi-square and Pearson's correlation tests were used to determine the association and correlation between the variables and the level of significance was set at $P < 0.05$. Consent was obtained from each participant and all data were kept confidential and anonymity was ensured by not including any names.

Ethical approval was obtained from the ethical committee of KIDS Dental college, Amalapuram.

Results

Of the 344 registered students, 301 (88%) agreed to participate and of these 72% (217) were female. The age ranged from 17 to 28 years (mean 22.3 years). There were 144 non-clinical students and 157 clinical students.

The association between the knowledge and attitudes of the respondents and their gender and clinical status is summarized in Table1. More than two-thirds (70%) displayed an acceptable level of knowledge regarding the types of SSBs and its ill effects if consumed excessively. Almost half (46%) reported having a positive attitude toward the consumption and ill health effects of SSBs. There were no significant differences between the males and females ($P = 0.11$) with respect to their levels of knowledge; however, more clinical students had an acceptable level of knowledge compared to nonclinical students ($P= 0.03$).

As far as attitudes were concerned, significantly more males had a negative attitude toward SSBs and were more likely to be seen entertaining and socializing with SSBs compared to females ($P = 0.02$).

There was no significant correlation between a positive attitude and high levels of knowledge regarding SSBs ($P = 0.40$ and Pearson's correlation [r] = 0.05). However, the vast majority of respondents who demonstrated a positive attitude had acceptable levels of knowledge as well.

More than a third (35%) consumed 0 teaspoons, 32% consumed 1–4 teaspoons, 13% consumed between 5 and 9, and 20% consumed >10 teaspoons daily.

The students' self-reported height and weight were used to calculate their BMI. Unfortunately, some of the students did not provide their details and as a result, they were excluded from the BMI analysis. Among 301 students, 175 (61%) were normal weight, 67 (22%) were overweight, 37 (11%) were underweight, and 22 (6%) were obese.

The association between the number of teaspoons consumed from SSBs and BMI, knowledge, attitude, gender, course and clinical status is shown in Table 2. There was association between the amount of sugar consumed and the students' BMI but no association between the gender. Those with poor knowledge and negative attitude consumed significantly more teaspoons of sugar from SSBs ($P < 0.05$) compared to those with good knowledge and positive attitude.

The association between BMI, gender is shown in table 3. Males were significantly more obese and overweight than females. ($p = 0.01$)

Discussion

The relatively high response rate of 88% could have been due to the questionnaires being handed out during lecture periods which are compulsory to attend.

A large proportion of the participants had adequate knowledge of the health hazards of excessive consumption of SSBs. This was similar to another study conducted on Nigerian dental students.[1]The high level of knowledge concerning SSBs and its sugar content could stem from the fact that the role of sugar in the etiology of dental caries is part of the curriculum.

Clinical students had significantly more knowledge than nonclinical students and this could be due to the increased exposure to the role of sugar in the etiology of dental caries in the more senior years. It could also be due to the fact that students in the clinical years provide dietary advice to their patients and this interaction may improve both their knowledge and attitudes toward the consumption of sugar.

There was a significantly greater number of females who displayed a positive attitude towards SSBs compared to males. This meant that females disliked SSBs more than males and did not see it as a means of entertainment with their friends. This could be as a result of them eating healthier, having a higher nutritional knowledge, higher engagement in food-related activities and showing a higher preference toward food items that are commonly included in their diet. Studies also reported that females describe food as more important and tended to be more careful about what and how much they consumed.[8]

Studies have shown that gender differences in food preferences appear to begin during childhood.[9] There has been no specific reasons behind gendered preferences and practices are not easily understood due to social and cultural differences among groups and individuals. It is however argued that it might be due to earlier involvement of females in food activities as compared to males and therefore females tend to be more aware and careful of what and how they eat and drink.[10]

On average, 20% of the students consumed more amount of sugar. This amount of sugar from one source alone is relatively high as the AHA recommends a maximum of between 6 and 9 teaspoons per day.[6]

Males were significantly more obese and overweight than females while the majority of females fell into the normal weight category. This was not surprising as it has been reported that females tend to watch the attributes of food such as calories and the amount of sugar and tend to eat healthier meals.[9] The majority of students were of normal weight and there was a correlation between the BMI and the amount of sugar ingested from SSBs. A number of studies have shown a significant association between frequent intake of SSBs and being overweight. The main reason being low levels of physical activity, high levels of television and computer screen time and high consumption levels of energy dense and nutrient poor food has been identified for the increase in BMI.[11]

Conclusions

These dental students had adequate knowledge levels related to SSBs, with clinical students displaying even more knowledge than nonclinical students. More females than males reported having a positive attitude towards SSBs and they claimed not to use SSBs for enjoyment or entertainment. The average consumption of sugar from SSBs was within the recommendations, but 20% of respondents consumed excessive amounts daily. There was a significant association between having good knowledge, a positive attitude and being a clinical student with a reduced consumption of sugar intake. The majority of students were of normal weight and there was a correlation between the consumption of sugar from SSBs and the BMI.

Recommendations

The knowledge of students should be improved by providing more lectures on the harms of sugars. The students should be educated on the consequences of excessive sugar consumption during all years of study and not to limit it to the later years. Access to SSBs should be reduced by increasing the taxes and by initiating policies in the dental colleges to ban the sales of these drinks.[12] This could be extended to the entire university including the medical and dental hospitals and all the other similar health facilities. Physical activities should be encouraged during the day by allowing a sports day which could improve the health of the students and allow them to interact between each other in a social and positive environment.

Table 1: The association between Knowledge and Attitudes of students with their gender and clinical status

	n (%)	Acceptable Knowledge, n(%)	Poor Knowledge, n(%)	p	Positive attitude n(%)	negative attitude n(%)	p
Male	87(28)	56(63)	31(37)	0.11	29(35)	58(65)	0.02*
Female	214(72)	155(72)	59(28)		111(50)	103(50)	
Non clinical	144(47)	95(64)	49(34)	0.03*	74(50)	70(48)	0.15
Clinical	157(52)	113(75)	44(28)		58(41)	99(63)	
Total		208(70)	93(32)		132(46)	169(56)	

Table 2: Association between daily sugar consumption (tea spoons) from sugar sweetened beverages and Body Mass Index, knowledge, attitude and clinical status.

Number of tea spoons of sugar, n(%)

	0	1-4	5-9	>10	Total	P
BMI(n=301) Underweight	9(19)	17(48)	5(11)	6(22)	37(100)	<0.01*
Normal	68(41)	51(29)	27(14)	29(15)	175(100)	
Overweight	22(39)	19(33)	11(10)	15(17)	67(100)	
Obese	4(20)	4(20)	8(31)	6(29)	22(100)	
Knowledge Good	73(35)	79(38)	22(11)	34(16)	208(100)	<0.01*
Poor	32(35)	16(18)	17(19)	28(27)	93(100)	
Attitude Positive	48(36)	54(41)	14(10)	16(12)	132(100)	<0.01*
Negative	54(35)	41(26)	28(14)	36(25)	169(100)	
Gender Male	29(34)	19(23)	15(18)	21(25)	84(100)	0.06
Female	77(35)	78(36)	24(11)	38(18)	217(100)	
Clinical status Non clinical	41(27)	53(36)	19(13)	36(24)	149(100)	0.02*
Clinical	65(43)	44(29)	20(13)	23(15)	152(100)	

Table 3: Association between Body Mass Index and Gender

	n(%)	Underweight,n(%)	Normal, n(%)	Overweight,n(%)	Obese,n (%)	P
Male	84(28)	2(3)	36(48)	34(39)	12(10)	0.01*
Female	217(72)	35(14)	146(66)	28(16)	8(4)	

Financial support and sponsorship
Nil.

Conflicts of interest
There are no conflicts of interest.

REFERENCES

1. Fadupin G, Ogunkunle M, Gabriel O. Knowledge, attitude and consumption pattern of alcoholic and sugar sweetened beverages among undergraduates in a Nigerian institution. Afr J Biomed Res 2014;17:75-82.
2. Malik VS, Popkin BM, Bray GA, Després JP, Willett WC, Hu FB. Sugar-sweetened beverages and risk of metabolic syndrome and type 2 diabetes: A meta-analysis. Diabetes Care 2010;33:2477-83.
3. World Health Organization. World Health Organization Study Group on Diet, Nutrition and the Prevention of Chronic Diseases. Geneva, Switzerland: World Health Organization; 1990.
4. Choi HK, Curhan G. Soft drinks, fructose consumption, and the risk of gout in men: Prospective cohort study. BMJ 2008;336:309-12.
5. World Health Organization. Sugars Intake for Adults and Children, Guideline. Geneva, Switzerland: World Health Organization; 2015.
6. American Heart Association. Recommended Daily Intake of Sugar; 2017.
7. World Health Organization. Obesity: Preventing and Managing the Global Epidemic-Report of a Consultation. Vol. 89. Geneva: World Health Organization; 2002. p. 253.
8. Bellows AC, Alcaraz V G, Hallman WK. Gender and food, a study of attitudes in the USA towards organic, local, U.S. Grown, and GM-free foods. Appetite 2010;55:540-50.
9. Lam V, Leman P. Children's gender-and ethnicity-based reasoning about foods. Soc Dev 2009;18:478-96.
10. Caraher M, Dixon P, Lang T, Carr-Hill R. The state of cooking in England: The relationship of cooking skills to food choice. Br Food J 1999;101:590-609.
11. Vartanian LR, Schwartz MB, Brownell KD. Effects of soft drink consumption on nutrition and health: A systematic review and meta-analysis. Am J Public Health 2007;97:667-75.
12. Cabrera Escobar MA, Veerman JL, Tollman SM, Bertram MY, Hofman KJ. Evidence that a tax on sugar sweetened beverages reduces the obesity rate: A meta-analysis. BMC Public Health 2013;13:1072.