



KAP Study About Carbonated Drinks Among Medical and Nursing Students at Teaching Hospital

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Abstract

To assess the knowledge, attitude and practices of students regarding carbonated drinks, a cross sectional study was conducted at Himalayan Institute of Medical Science (H.I.M.S.), Dehradun. The study subjects comprised of medical and nursing students at HIMS. A total of 137 students were randomly selected and included in the study. A self administered pre-tested structured questionnaire was introduced for the purpose of the study. Maximum of the medical students responded gastritis (27.14%) specifically as the important ill-effects associated with the consumption of the carbonated drinks for long period of time followed by teeth and bone diseases (22.85%) and about 28.57% of the them were not aware of the ill-effects of the same at all. About 39.65% of the nursing students responded gastritis followed by diarrhoeal diseases (36.2%) as the ill-effects for the same. A holistic approach should be incorporated to combat the problems associated with the consumption of carbonated drinks.

Key Words

Carbonated drinks, Knowledge, Attitude, Practices, Teeth erosion, Gastritis

Introduction

Youngsters consume carbonated drinks in breathtaking quantities and are often unaware of the health hazards of the excess consumption. Carbonation occurs when carbon dioxide is dissolved in water or an aqueous solution (1, 2). A soft drink is a beverage, often carbonated, that does not contain alcohol. The name "soft drink" specifies a lack of alcohol by way of contrast to the term "hard drink". The term "drink", while nominally neutral, often carries connotations of alcoholic content. Beverages like colas, sparkling water, iced tea, lemonade, squash, and fruit punch are among the most common types of soft drinks, while hot chocolate, hot tea, coffee, milk, tap water, and milkshakes do not fall into this classification. Many carbonated soft drinks are optionally available in versions sweetened with sugars or with non-caloric sweeteners. Research suggests kids who drink a lot of soft drinks risk becoming fat, weak-boned, cavity-prone and caffeine-addicted. Scientific studies have shown how as few as one or two soft drinks a day can increase one's risk for numerous health problems. Some of these health problems are obesity, diabetes, tooth decay, osteoporosis, nutritional deficiencies, heart disease, and many neurological disorders (3). It is not so much that

carbonated beverages are bad - at least not in moderation ,it is that many people drink too much of them. Many sodas contain caffeine, which is a natural diuretic, and so can actually make thirstier and encourage dehydration. It can also make it harder to get enough sleep or make edgy. Many sodas are high in calories and have a lot of sugar - not good for waistline or teeth. When one consumes carbonated beverages instead of milk, juice and water, body will not get some of the nourishment as per the needs (4). There is a growing concern in the medical and scientific communities about the harmful effects associated with carbonated soft drinks. Soft drinks have been around for over a hundred years, but many of their deleterious health effects have not been studied or known (3). Hence the present study has been undertaken to assess the KAP of youngsters regarding health hazards of excess carbonated drinks consumption.

Material and Methods

This cross sectional study was conducted at Himalayan Institute of Medical Science (H.I.M.S.), Dehradun. The study subjects comprised of medical and nursing students at HIMS. A total of 76 medical students and 61 nursing students were randomly selected and included in the study.

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A self administered pre-tested structured questionnaire was introduced for the purpose of the study. For the active support and co-operation, it was imperative to explain the aim of the study to the head of the institution and the targets and consent was taken for the same. The study had been approved by the ethical and research committee of the institute. All the data collection forms were checked twice for completeness and consistency and all errors or discrepancies were corrected. At the end of the study health education was given for the same.

Statistical Analysis

The data was entered in Epi Info Statistical Package and subsequently analyzed. Fisher Exact Test, 1 Tailed P test and chi square test was applied to study the correlation.

Results

The study was conducted amongst the medical and nursing students. A total of 76 medical and 61 nursing students were surveyed and the findings are as follows. *Table- I* shows the knowledge of the students regarding the carbonated drinks. About 70 (92.10%) of the medical students and 58 (95.08%) of the nursing students had ever heard about the carbonated drinks. Maximum of the medical students responded gastritis (27.14%) specifically as the important ill-effects associated with the consumption of the carbonated drinks for long period of time followed by teeth and bone diseases (22.85%) and about 28.57% of the them were not aware of the ill-effects of the same at all. About 39.65% of the nursing students had responded gastritis followed by diarrhoeal diseases as the ill-effects associated with the consumption of the carbonated drinks. The difference between knowledge of medical and nursing students when compared with or without awareness regarding ill-effects associated with the carbonated drinks was found to be statistically significant. *Table- II* depicts the attitude of the students regarding the consumption of the carbonated drinks. About 17.14% and 10.34% of the medical and nursing students respectively were in favour of recommending carbonated drinks for long period of consumption. However majority of the medical (75.71%) and nursing (82.75%) students were in favour of consuming fruit juice if given an option between carbonated drinks and fruit juice. The difference between the attitudes of the two groups of students was found to be statistically insignificant. *Table-III* describes the practices of the students regarding consumption of the carbonated drinks. As far as the practice of frequent consumption of the carbonated drinks by the students is concerned, maximum of the nursing students (51.72%) frequently consume the same. Majority of the medical

(37.4%) and nursing students (32.75%) consume 200-350 ml of the carbonated drinks at a time. Maximum of the medical students (49.05%) consume Pepsi whereas nursing students consume mostly Coke as the commonest soft drink and this difference between the practices of consumption of soft drinks was found to be statistically significant.

Discussion

It is generally understood that soft drinks, even though they contain a large number of calories, have little nutritional benefit and are known as "empty calories". Soft drinks are composed mostly of filtered water with diet colas containing close to a hundred percent water. Most of the calories in soft drinks are from refined sugars, and there are no other nutritionally beneficial components in soft drinks. Dr. Charles Best, the discoverer of insulin, claims that teenagers who consume too many soft drinks have cirrhosis of the liver similar to what chronic alcoholics have. (5) A common problem that is associated with consumption of a large number of soft drinks is the increased acid levels throughout the body. All soft drinks are very acidic, but dark colas such as Coke and Pepsi are much more acidic. (3) In the present study the knowledge base of the students regarding the harmful effects of carbonated drinks is not satisfactory. William Frazier states, "in order to neutralize a glass of cola, it takes 32 glasses of high pH alkaline water." (5) Many doctors believe that there is a correlation between acids increasing the risk of disease. This is manifested in an especially painful way when one gets gastronomic distress (GI). Gastronomic distress is characterized by increased stomach acid levels. Gastronomic distress causes the inflammation of the stomach and erosion of the stomach lining. This is characterized as a painful stomachache. These symptoms are caused by caffeine and acids found in soft drinks such as: acetic, fumaric, gluconic and phosphoric acids. The combination and strength of these acids are so strong that when a drain is clogged a plumber will often use a soft drink, or if a car battery is corroding one can use a soft drink to dissolve the corrosion. Prolonged increased acid levels will cause erosion of the gastric lining, which is very painful and disrupts proper digestion. In this study students have responded gastritis as one of the important ill-effects of the consumption of carbonated drinks. (3) A very serious effect of soft drinks on people's health is the correlation between soft drink consumption and the increased risk of bone fractures and osteoporosis. The large amounts of sugar, bubbles caused by carbon dioxide, and phosphoric acid that are found in soft drinks remove nutritious minerals from bones allowing the bones to become weak and increasing the



Table 1. Knowledge of the Students Regarding The Carbonated Drinks

S.No.	Responses	Medical Students No. (%)	Nursing Students No. (%)
1.	Ever heard about Carbonated Drinks.	(n = 76)	(n = 61)
	YES	70 (92.10)	58 (95.08)
	NO	06 (07.89)	03 (04.91)
(Fisher Exact Test, 1-tailed p-value: 0.36)			
2.	Ever read about the ill-effects of Carbonated Drinks.	(n = 70)	(n = 58)
	YES	61 (87.14)	56 (96.55)
	NO	09 (12.85)	02 (03.44)
(Fisher Exact Test, 1-tailed p-value: 0.05)			
3.*	Ill-effects associated with the consumption of Carbonated Drinks.	(n = 70)	(n = 58)
	Teeth & bone disease	16 (22.85)	08 (13.79)
	Respiratory disease	11 (15.71)	05 (08.62)
	Diarrhoeal disease	08 (11.42)	21 (36.20)
	Nausea	-	09 (15.51)
	Belching	-	03 (05.17)
	Gastritis	19 (27.14)	23 (39.65)
	Others**	30 (42.85)	44 (75.86)
	Not aware	20 (28.57)	11 (18.96)
	$(\chi^2 = 5.17; p < 0.05, \text{Significant})$		
4.	Consuming Carbonated Drinks for long period is-	(n = 70)	(n = 58)
	Good for health	08 (11.42)	01 (1.72)
	Bad for health	62 (88.57)	57 (98.2)
(Fisher Exact Test, 1-tailed p-value: 0.03)			

Table 2. Attitude of the Students Regarding Consumption of Carbonated Drinks

S. No.	Responses	Medical Students No. (%)	Nursing Students No. (%)
1.	Would like to recommend Carbonated Drinks for prolong consumption.	(n = 70)	(n = 58)
	(a) YES	12 (17.14)	06 (10.34)
	(b) NO	58 (82.85)	52 (89.65)
$(\chi^2 = 1.21; p > 0.05, \text{Insignificant})$			
2.	Would like to prefer-	(n = 70)	(n = 58)
	(a) Fruit juice	53 (75.71)	48 (82.75)
	(b) Fruity/ Maza/ Slice	02 (02.85)	04 (06.89)
	(c) Carbonated Drinks	14 (20.00)	05 (08.62)
	(d) Others	01 (01.42)	01 (01.72)
$(\chi^2 = 3.25; p > 0.05, \text{Insignificant})$			

Table 3. Practice of the Students Regarding Consumption of Carbonated Drinks

S. No.	Responses	Medical Students No. (%)	Nursing Students No. (%)
1.	Frequently consume Carbonated Drinks.	(n = 70)	(n = 58)
	(a) YES	32 (45.71)	30 (51.72)
	(b) NO	38 (54.28)	28 (48.27)
$(\chi^2 = 0.46; p > 0.05, \text{Insignificant})$			
2.	Average amount of Carbonated Drinks consume at a time.	(n = 70)	(n = 58)
	(a) < 200 ml	11 (15.71)	18 (31.03)
	(b) 200 – 350 ml	26 (37.14)	19 (32.75)
	(c) 350 – 500 ml	07 (10.00)	08 (13.79)
	(d) > 500 ml	09 (12.85)	02 (03.44)
	(e) No Response	17 (24.28)	11 (18.96)
$(\chi^2 = 0.53; p > 0.05, \text{Insignificant})$			
3.	Commonest Carbonated Drinks consumed	(n = 53)	(n = 47)
	(a) Coke	22 (41.50)	29 (61.70)
	(b) Pepsi	26 (49.05)	16 (34.04)
	(c) Not specific	05 (09.43)	02 (04.25)
$(\chi^2 = 4.06; p < 0.05, \text{Significant})$			



risk for them to break. This is done by the phosphoric acid disrupting the calcium-phosphorous ratio, which dissolves calcium from the bones. Many people consume soft drinks instead of necessary beverages like milk, so their bodies are not receiving enough nutrients, especially calcium (3). A study concluded, "the high consumption of carbonated beverages and the declining consumption of milk are of great public health significance for girls and women, because of their proneness to osteoporosis in later life" (6, 7). However this fact is more or less consistent with the findings of the present study. Dental cavities are often associated with carbonated beverage. This association is important because the amount of sugars that are consumed is important in forming caries, which is when a cavity affects only the enamel, the outer protective layer of a tooth. Caries are caused by the bacteria *Mutans streptococci*, which is a part of dental plaque. The bacteria attach to teeth and produce high amounts of acid from sugars and other types of acid (3). This fact has also been favoured by the students in the present study. The acids that are not buffered dissolve the apatite crystals of a tooth's surface; this process is called demineralization. Demineralization is characterized by a thick layer of plaque blanketing teeth, dropping to a low pH for several hours removing the calcium nutrients of the tooth. Teeth can be mineralized by calcium, fluoride and phosphate, which are all contained in saliva. Caries are formed when the process of demineralization occurs more often than the process of remineralization. Enamel, which is composed of cementum and dentin, naturally protects teeth. Dentin is a highly substituted calcium phosphate salt, which is also called apatite. Carbonate makes the apatite very soluble but fluoride helps to strengthen the apatite. Cycles of demineralization and remineralization of teeth allows for the teeth to contain more fluoride, which makes the teeth stronger (8).

The important thing to remember is that over consumption of soft drinks should be avoided because of their numerous harmful effects such as as: obesity, osteoporosis, nutritional deficiencies, and tooth decay. It is important to be aware of the harmful effects of such deleterious beverages (3). Carbonated beverages with sugar (like cola drinks) aren't especially healthy when consumed in large amounts. They contain no nutrients, large amounts of sugar, phosphate and are acidic. The sugar and acid can contribute to tooth decay. The sugar is also a source of extra calories, so if you're concerned about weight, avoid soft drinks. The phosphate may interfere with calcium and bone density. In addition, cola drinks (and some other carbonated beverages) contain large amounts of caffeine. Caffeine can cause excitability, insomnia, nervousness, stomach upset, tremors and extra heartbeats. One can a day of cola beverage shouldn't cause any problems for most teens, as long as you stop

at that (4). The liquid fruits can be used as a natural alternative to synthetic beverages. They can be suitably diluted, blended with other juices and carbonated as soft drink (9). The sugar content is more harmful from the long-term aspects than the pesticide residues in these carbonated drinks. The Minister of Health and Family Welfare (Dr. Ambumani Ramadoss) has clarified in the Parliament the steps that the Government has taken, from the JPC Report of 2003 and what process the Govt. is going through. After the JPC's Report that standards should be fixed to these carbonated drinks, namely, Coke, Pepsi or other subsequent drinks, India was one of the first countries in the world, to fix standards for carbonated drinks (10). This KAP study is first of its kind in Uttarakhand State. The increasing focus on the ill-effects of carbonated drinks and the need for research will help in the development of preventive, promotional and curative health programme in the community.

Conclusion

The knowledge of the students regarding the ill-effects of the consumption of carbonated drinks is not convincing one. The attitudes of the students are relatively better but their practices are neither preventive nor health promoting. Thus, it is recommended that a holistic approach should be incorporated to combat the problems associated with the consumption of carbonated drinks. There is a need of Behavioral Change (BCC) for youngsters.

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