

## Original article

**Soft Drink Consumption Patterns and Dependence among Medical Students in Riyadh****Mohammed Moizuddin Khan<sup>1,3</sup>, Omar Hasan Ali Ourfih<sup>1</sup>, Mohamed A. Samhan<sup>1</sup>  
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**ABSTRACT**

**Background:** Soft drink consumption has become a highly visible and controversial public health and policy issue. Soft drinks are viewed by many as a major contributor to obesity and related health problems i.e. increased risk of type II diabetes and cardiovascular disease and have consequently been targeted as a means to help curtail the rising prevalence of obesity. So the present was conducted to study soft drink consumption patterns and dependence among medical students in Riyadh city.

**Material and Methods:** The present study was a single-center, prospective Cross-sectional study, conducted in the College of Medicine, Dar Al Uloom University, Riyadh Kingdom of Saudi Arabia. Students of the university and the college of medicine, Dar Al Uloom University Riyadh from 1<sup>st</sup> January, 2022 to 15<sup>th</sup> January 2022.

**Results:** In the present study 177 students were participated. Most of them 91 (51.4%) students were in the age group between 21-25 years. Out of those 177 students, 146(82.5%) students consum soft drinks and only 31 (17.5%) students are not consumers of soft drinks. The majority of students 77(52.7%) preferred cold drink was Pepsi. The second rank was Sprite 49(33.6%) and the least preferable one was 7Up 34(23.3%). The majority of 87(49.1%) students agreed that soft drinks are not good for health, 51(28.9%) of students were somewhat agreed, 10(5.6%) students do not know that the consumption of soft drinks is not good for health.

**Conclusion:** The present study shows that soft drinks consumption among medical students of Saudis is higher i.e. 82.0%. The majority students need soft drinks while taking their meal and believe that soft drinks improved digestion. The majority medical students agreed that soft drinks are not good for health, as medical students should focus on promoting healthy food choices among them selves.

**Keywords:** Soft Drink, Sugar Sweetened Beverage, Energy Drinks.

**Introduction:**

Soft drink consumption has become a highly visible and controversial public health and policy issue. Soft drinks includes Sugar sweetened beverage. Sugar sweetened beverage consumption (including the full range of soft drinks, fruit drinks and sports drinks) has increased considerably across the globe during the last two decades. Sugar sweetened beverages, typically containing sucrose, high-fructose corn syrup, or fruit juice concentrates, may lead to weight gain through the high added sugar content, low satiety, and potential incomplete compensation for total energy, leading to increased energy intake [1].

Soft drinks are viewed by many as a major contributor to obesity and related health problems i.e. increased risk of type II diabetes and

cardiovascular disease and have consequently been targeted as a means to help curtail the rising prevalence of obesity, particularly among children [2]. WHO has recognized the specific contribution of a subset of factors, including soft drinks, as being independently associated with an increased risk of obesity [3]. Consumption of soft drinks is associated with increased total energy intake, weight gain [4] and an overall less healthy diet [5]. The issue is not new. In 1942 the American Medical Association mentioned soft drinks specifically in a strong recommendation to limit intake of added sugar. At that time, annual US production of carbonated soft drinks was 90 8-oz (240-mL) servings per person; by 2000 this number had risen to more than 600 servings [6].

Literature has also shown that college or university going students can be a critical period for unhealthy weight related behaviors including sweetened beverage consumption [7,8]. University and college students are heavy consumers of soft drinks. Around 65% of students reported daily consumption of some form of sugar sweetened beverages [9]. Also energy drinks are very popular in students of colleges. In the US, up to 59% of college students reported energy drink consumption during the last week, whereas 29% of students consumed one or more energy drinks the day before completing the survey [10]. Among Turkish students, 10.3% of current energy drink users reported daily intake [11]. Moreover, males were more likely than females to consume sugar sweetened beverages and energy drinks daily [9,10].

Soft drinks consumption in Saudi Arabia is high, According to Euromonitor International (2015), Saudi Arabia is identified as the largest consumer of soft drinks in the Middle East, and this market continuously on the rise [12]. The high intake of soft drinks by Saudis has been reported in various studies. Murad et al. found that 35% of healthy adults consume soft drinks either daily or 3 to 6 times weekly, and 30.2% less than three times weekly [13].

For the development effective and customized intervention strategies aiming to decrease university students' soft and energy drink intake, it is important to get insight into factors associated with students' consumption. In a focus group discussion six US colleges revealed that taste was the most important reason for choosing a non-alcoholic beverage, whereas price was the second most commonly mentioned factor influencing choice, whereas the health and nutritional content of beverages had limited influence on choice [14]. Another focus group study of Australian university students reported that non-alcoholic beverage consumption was related to the setting in which alcohol is usually consumed, socializing with friends, and family influences and some physical environmental cues like purchasing of fast foods, and ready availability, pricing and promotion of caloric beverages [15].

Many countries have considered bans or limits on soft drink sales in schools, college and university premises. A key question is whether actions taken to decrease soft drink consumption are warranted given the available science and whether decreasing

consumption of soft drinks would benefit public health. So present was carried out to study soft Drink Consumption Patterns and Dependence among Medical Students in Riyadh.

#### **Aim & Objective of Study:**

**Aim:** To study Soft Drink Consumption Patterns and Dependence among Medical Students in Riyadh.

#### **Objective of Study:**

To examine the soft drink consumption patterns and assesses the level of awareness of soft drink among Riyadh medical students.

#### **Material & Methods:**

The present study was a single-center, prospective Cross-sectional study, conducted in the College of Medicine, Dar Al Uloom University, Riyadh Kingdom of Saudi Arabia on students of the university and the College of Medicine, Dar Al Uloom University, Riyadh from 1<sup>st</sup> March 2023 to 15<sup>th</sup> March 2023. The study approval was obtained from the institutional ethical committee.

#### **Inclusion criteria:**

- All university/college students in Riyadh of both gender and age-group.
- Student giving informed consent.

**Exclusion criteria:** Student with attendance less than seventy percent.

**Translation of the Questionnaire:** The questionnaire was written in English. However, most of the participants in this study could not read the English version. Therefore, an Arabic version of the questionnaire was developed. The Translators has reviewed the questionnaire and approved the Arabic version of the questionnaire.

**Survey Questionnaire:** A questionnaire was developed to collect data per the study objective. The questionnaire consisted of 16 already standardized questionnaires divided into different parts including personal information, cold drinks consumption pattern, reason for consumption & personal beliefs. Overall, the survey questions pertained to the frequency of cold drink consumption as well as factors that might be considered by college students when consuming of cold drinks. Both sets of questionnaires (male and female) were the same.

**Data Collection:** The survey administration and data collection took place from 1<sup>st</sup> March, 2023 to 15<sup>th</sup> March 2023. The data was collected online with the help of Microsoft

Forms /Google Form. The students were sent the forms using emails / What's App/SMS/ compatible social media. The sent link of survey was active for 24 Hours. All questions in Google format of survey questionnaires were compulsory to avoid non response for some questions. In beginning of Google Form survey questionnaires informed the purpose of the study and the consent for participation in the study. About 10–15 minutes

were needed for participants to complete the survey questionnaires.

**Statistical Analysis:**

Data was collected and compiled using Microsoft Excel, analyzed using the SPSS 23.0 version. Frequency, percentage, means and standard deviations (SD) were calculated for the continuous variables, while ratios and proportions were calculated for the categorical variables.

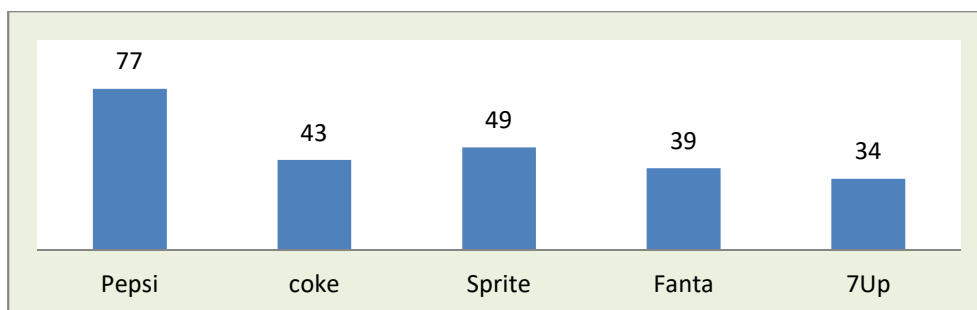
**Observation and Results:**

**Table 1 : Demographic Profile of Students:**

Perticular	No. of students [n=177]	Perenatge
Age-Group	≤20 years	19.2
	21-25	51.4
	25-30	23.7
	>30 years	5.6
	Mean±SD	23.68±4.95 years
Gender	Male	53.1
	Female	46.9
Residency	Living at Home	41.8
	Living in a Student Residence	58.2
BMI Classification	Underweight (<18.5)	10.2
	Normal Weight (18.5-24.9)	35.0
	Overweight (25.0-29.9)	28.8
	Obesity Class I (30.0-34.9)	15.8
	Obesity Class II (35.0-39.9)	5.6
	Obesity Class III (>40.0)	4.5

In the present study 177 students were participated. Most of those i.e. 91 (51.4%) age group between 21-25 years and a minimum of 10(5.6%) students belong to an age of more than 30 years. The mean age of students was 23.68±4.95 years. The majority

of 94(53.1%) students were male. Most of the students 62(35%) were having normal weight and 51 (28.8%) students were overweight. The majority of students i.e. 103 (58.2%) live in student residences.



**Figure 1: Type of soft Drink brand preferred for Consumption**

Out of those 177 students, 146 (82.5%) students consume soft drinks and only 31 (17.5%) students were not consumers of soft drinks. The majority of students; 77 (52.7%) preferred cold Pepsi drink, The second rank was for Sprite; 49(33.6%), and the least preferable one was 7Up; 34(23.3%).

**Table 2: Usage of Soft Drinks among students:**

Particular	No. of Students [n=146]	Percentatge	
How often do you consume soft drinks?	Many Times in a Day	18	12.3
	Daily	65	44.5
	Weekly	40	27.4
	Monthly	15	10.2
	Only on special occasions	08	5.5
When choosing a soft drink what influences your decision? [n=146]	Calories	47	32.2
	Availability	13	8.9
	Taste	79	54.1
	Price	22	15.1
Concerned about the use of artificial flavorings and sweeteners in soft drinks?	Yes	102	57.6
	No	40	22.6
	I'm not sure	35	19.8
Over the course of a month, how much soft drink do you think you drink? [n=146]	May be a Liter or Two	104	71.2
	Around 10 Liters	28	19.2
	Around 50 Liters	14	9.6
How frequently do you have more than one can of soft drinks consecutively? [n=146]	Never	93	63.7
	Sometimes	32	21.9
	Frequently	18	12.3
	Always	3	2.1

Table 2 shows survey questions, the first question was related to How often you consume soft drinks, the majority of 65(44.5%) students consume daily soft drink followed by weekly 40(27.4%) and 15(10.2%) students consume soft drinks monthly. The second question, when choosing a soft drink what influences your decision, in the majority of 79(54.1%) students choose a soft drink influenced their decision due to taste followed by Calories 47(32.2%), price 22(15.1%) and only 05(3.42%) due to caffeine. Majority of students 102(57.6%) were concerned about the use of artificial flavorings and sweeteners in soft drinks, and

40(22.6%) students were not concerned about the use of artificial flavorings and sweeteners in soft drinks.

The majority of students 104(71.2%) consumed only one or two liter of cold drink and 28 (19.2%) students consumed around 10 Liters per month and only 14(9.6%) of students reported consuming around 50 liters per months. The majority 93(63.7%) of students never consecutively driks one can of soft drink followed by Sometimes 32(21.9%), frequently 18(12.3%) and only 03(2.1%) students always drink one can of soft drink.

**Table 3: Soft Drink Consumption Dependence Behaviour of Students:**

Particular	No. of participants [n=146]	Percentatge	
Need soft drinks when I have my meal?	Yes	65	44.5
	No	81	55.5
I feel my digestion better when I eat with soft drinks [n=65]	Yes	39	60.0
	No	26	40.0
How often do you go out of your way to obtain a can of soft drinks?	Never	98	55.4
	Sometimes	67	37.9
	Frequently	9	5.1
	Always	2	1.2

You surely need a soft drink while? [n=146]	While eating	65	44.5
	While holidaying /partying	43	29.4
	while playing	29	19.9
	while working	12	8.2
	While Studing	34	23.3

Table 3 shows questions regarding the soft drink consumption dependence in students. Around 65(44.5%) students needed soft drinks while having their meals. Out of 65 students 39(60.0%) of students believed that soft drinks improve

digestion. In the present study, the majority of 65(44.5%) students need soft drinks while eating, followed by 34(23.3%) while studying, 43(29.4%) While holidaying /partying, and 29(19.9%) while playing.

**Table 4: Do You Feel Soft Drinks Consumption Is Not Good For Health? [n=177]**

	No. of Students	Perccnatge
Agree	87	49.1
Somewhat agree	51	28.9
Neither agree nor disagree	23	12.9
Somewhat disagree	06	3.4
Do not know	10	5.6

The majority of 87(49.1%) students agreed that soft drinks were not good for health, 51(28.9%) students somewhat agreed and 10(5.6%) students did not know that the consumption of soft drink is not good for health.

**Discussion:**

The sale of soft drinks in the market over the last couple of years has been increased. The intake of soft /energy drinks among college students has increased. Soft drink consumption is a highly noticeable and controversial public health issue. This research was aimed at evaluating the soft drink consumption patterns and assessing the level of awareness of soft drink of Riyadh medical students.

In the present study 177 students were participated. Most of students i.e. 91 (51.4%) age group between 21-25 years and a minimum of 10(5.6%) students belongs to ages more than 30 years. The mean age of students was 23.68±4.95 years. Similarly, *Tom Deliens et al [16] found that the mean age of participants was 21.2 ±2.1 years. Nada Benajiba et al [17] found that 58.0% of participants have ages between 20-29 years.*

The majority of students were male (53.1%) and female (46.9%). Whereas, *Ismael San Mauro Martin et al [18] found that 66.28% were female. Also Tom Deliens et al [16] & Nada Benajiba et al*

*[17] found 59.8% & 76.5% of participants were female respectively.*

Most of the students 62(35%) were having normal weight and 51 (28.8%) students were overweight. Also Tom Deliens et al [16] found 78.5% had normal weight and 10.4% were overweight and 1.4% were obese.

In the present study, out of 177 students, 146 (82.5%) students consume soft drinks and only 31 (17.5%) students are not consumers of soft drinks. The majority of students; 77 (52.7%) preferred cold Pepsi drink, The second rank was for Sprite; 49(33.6%), and the least preferable one was 7Up; 34(23.3%).

Almost one-third regularly consumed soda, but regular consumption of sports and energy drinks was less common. Nearly one-fifth of participants were regular consumers of artificially-sweetened soda. Regular consumption of each drink type was substantially higher for young adults than for older age groups. Nevertheless, the prevalence of drinks reported in this study was comparable to the Australian Health Survey data [33], but was below prevalence reported in the US population [41,55] and for daily SSB consumption in the UK [ 43] and Norway [ 39].

In present study, the majority of 65(44.5%) students consume daily soft drinks followed by 40(27.4%) and 15(10.2%) of students consume soft

drink weekly and monthly respectively. Whereas *Nada Benajiba et al* [17] reported that the majority 44.3% of respondents consumed soft drinks at least once a week, 26.6% consumed soft drinks once or twice a week and more than 11.6% drank usually (3-6 times per week) and consuming soft drinks on a daily basis was reported by 6% of the respondent.

The majority 93(63.7%) of students never consecutively drank one can of soft drink followed by Sometimes 32(21.9%), frequently 18(12.3%) and only 3(2.1%) students always driks one can of soft drinks. *Nada Benajiba et al* [17] reported 57.2% less than one Can of soft drink consumed each time, 38.7% of One can, 3.4% of two can and 0.8 % respondent consumes more than two can of soft drinks.

In the present study majority of 65(44.5%) of students need soft drinks while eating, followed by 34(23.3%) while studying, 43(29.4%) while holidaying /partying and 29(19.9%) while playing. *Nada Benajiba et al* [17] showed high frequencies of consumption are the ones who have a strong attitude towards considering these drinks as essential for social gathering. Considering the specific relevance of the social environment and interaction for eating behaviours, this evidence should be highly taken into account when designing nutrition education programs aiming to reduce soft drinks consumption among the Saudi population.

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The majority of 87(49.1%) students agree that soft drinks are not good for health, 51(28.9%) students somewhat agreed and 10(5.6%) students do not know that the consumption of soft drink is not good for health. Attitudes related to soft drinks consumption, about three- fourth of the respondents did not agree that soft drinks were healthy and a fifth is not enjoyable [17].

## Conclusion:

The present study shows that soft drinks consumption among medical students of Saudis is higher i.e. 82.0%. The majority of medical students preferred Pepsi soft drink followed by Sprite and the least preferable one was 7Up. The majority of students need soft drinks while having their meals & believe that soft drinks improve digestion. The most of the medical students agree that soft drinks are not good for health. As medical students should focus on promoting healthy food choices among themselves. Parents should be encouraged to implement stricter family rules about soft drink intake. The availability of soft drinks at home and on campus should be targeted and prohibited. The goverment should promote cheaper affordable and accessible healthy alternatives to achieve the desired effects of reducing the high consumption of soft drinks.

## Limitations:

The limitation of this study is a single center study and the sampling technique was snowballing, which could influence the representativeness of the study population.

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