

Mineral Supplements, Multivitamins, and Energy Drinks are Commonly Consumed

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ABSTRACT

In India, there has been an increase in the use of energy drinks and dietary supplements. However, the benefit of taking multivitamins and nutritional mineral supplements on a regular basis is still debatable. The purpose of this study was to collect information on the types of nutritional mineral supplements and energy drinks consumed by school adolescents, with a focus on the impact of consumption on BMI (BMI). The study involved 120 high school adolescent students between the ages of 14 and 19. A semi-structured questionnaire was used to collect data. Diet-related questions were asked using a 24-hour dietary recall method, and the questionnaire also determined their physical activity. The subjects' height and weight were measured, and their BMI was calculated. In this study, 55 percent of respondents said they had consumed energy and sports drinks in the previous two weeks, and 43 percent said they had consumed one or more types of multivitamin and nutritional mineral supplements without analysing their need or visiting a physician. Vitamin C (5%) and D (5%) were the most commonly consumed vitamins without a prescription, while iron (6%) and calcium (5%) were the most commonly consumed minerals without a prescription among the study participants. Curiosity was cited as a reason for using energy and sports drinks, followed by peer pressure, while students who consumed them cited perceived short-term health benefits and parental supply as common causes. The consumption of energy and sports drinks was also found to be statistically significant when measured by the body mass index (BMI). Thus, in order to be most relevant and effective, health education programmes should incorporate young people's perceptions, aspirations, and motivations into the planning of interventions and activities.

Keywords: energy drinks, nutritional mineral supplements, multivitamins

I. INTRODUCTION

In India, there has been an upsurge in the use of nutritional supplements [1]. However, the usefulness of taking multivitamins and nutritional mineral supplements on a daily basis is still debatable [2]. Not only are nutritional mineral supplements and the use of sports and energy drinks popular among adolescents who participate in sports, but they are also popular among those who merely desire an energy boost [3]. Energy drinks contain a lot of caffeine and sugar, as well as amino acids like taurine. Excessive caffeine usage can lead to gastrointestinal difficulties, heart problems, seizures, anxiety, tumours, and sleep disruptions [4]. After a strenuous workout, sports drinks are used to rehydrate and prevent hyponatremia. However, Harvard University researchers discovered that 13% of marathon runners had hyponatremia, and that those who drank sports drinks during the race were just as likely to be hyponatremia patients as those who drank water. On the other hand, the high sugar and sodium content of sports drinks, on the other hand, is undesirable for individuals who take them without getting enough exercise. Individuals with a higher body mass index (BMI) and current smokers are less likely to utilise dietary supplements, while those with a higher BMI and regular physical activity are more likely to use them. Individuals who take dietary supplements have healthier diets that are higher in micronutrients [5].

According to research, well-nourished people who take multivitamin and nutritional mineral supplements do not appear to benefit in the prevention of cardiovascular disease or chronic diseases such as diabetes. As a result, many medical specialists believe that a well-balanced nutritional diet and regular exercise are considerably more useful than the once-daily multivitamins that many people have been taking to improve their health and immunity. As a result, given the ambiguity around the need for and benefits of nutritional supplements, as well as the potential negative consequences of improper use, it is critical to review and evaluate the validity of their use. The study of academic interest in the achievements of schoolchildren [6], academic achievement of adolescents in relation to parental pressure on schoolchildren [7], and psychological and social difficulties in schoolchildren [8] was recently carried out.

II. MATERIALS AND PROCEDURES

It was a cross-sectional study with a cohort of school teenagers aged 14 to 19, who were recruited from two schools, one public and the other private, in the Aligarh district of Uttar Pradesh (India). According to previous studies on nutritional supplementation, 40% of people take nutritional mineral supplements. The minimum sample size for this study is 84 if the study's power is 80 percent and the degree of confidence is 95 percent. A total of 120 teenagers' children were contacted for the study, assuming a non-response rate of 20% and rounding off to the closest zero. A total of 112 students agreed to participate in the research. A list of teenagers aged 14 to 19 years old, from classes 9 to 12, was compiled from the Aligarh district of Uttar Pradesh's selected schools (India). To achieve the appropriate sample size, the study subjects were chosen using a random number table. Subjects who took dietary supplements as a therapy for a recognised deficient condition were excluded from the study.

III. PROCEDURES AND TOOLS USED IN DATA COLLECTION

Prior to the start of the study, official authorization from the authorities of both schools was acquired. The information was gathered according to a semi-structured schedule that had been thoroughly tested. A semi-organized interview schedule was used to collect information on nutrition, supplement use, and supplement choice, as well as the reasons for supplement use. The 24-hour dietary recall approach was used to get a dietary history. The subjects' height and weight were measured with established devices and methodologies. The subjects' Body Mass Index (BMI) was estimated using the formula: $BMI = \text{Weight (kg)} / [\text{height in metres}]^2$ after taking adequate measurements of their weight (kg) and height (m). The height and weight measuring equipment were precalibrated for zero inaccuracy. The measurements of height and weight were taken to the nearest 0.1 cm and 0.1 kg, respectively, to assure accuracy. To limit the inaccuracy, a mean of three readings was used as the final reading.

IV. CONSIDERATIONS ON MORALITY

The consent form was signed by subjects over the age of 18, and the assent form was handed to teenage students between the ages of 14 and 17 for signature by a parent or guardian. Before beginning the study, the subjects were given a subject information sheet that detailed the interview and examination procedures. All participants were assured of the confidentiality of their data. Prior to the start of the trial, the Institutional Ethical Committee (IEC) gave its approval.

V. ANALYTICAL STATISTICS

The information gathered from the surveys was evaluated to determine supplement and energy drink preferences, as well as frequency, pattern, and reasons for consumption. The relationship between age and product consumption has been investigated. The quantitative data collected was used to investigate the relationship between BMI and the usage of dietary supplements, energy drinks, and sports drinks.

VI. DISCUSSION OF THE FINDINGS

The questionnaire was completed by 112 adolescent students in total. There were 57 males and 55 females among them. The adolescents in the study ranged in age from 16 to 19 years old. As indicated in Table 1, the majority of the respondents were 16 years old, while the least number of respondents were 14 and 18 years old (0 respondents).

Table 1: The age distribution of the study participants (n=112)

S. no.	Age in years	Frequency (n=112)	Percentage
1.	15	26	23.0
2.	16	51	46.0
3.	17	21	19.0
4.	19	16	14.0

It was discovered that nearly 55% of adolescent students reported drinking energy and sports drinks in the previous two weeks; however, only 43% of the subjects reported taking one type of multivitamin and nutritional mineral supplement in the previous two weeks without assessing any need or consulting a physician. When asked why they were drinking sports energy drinks for the first time, the majority of the survey participants (42 percent) said it was because they were curious, followed by (22 percent) because they were motivated by friends. The frequency of intake of energy and sports drinks by adolescent children revealed that the majority of those who reported drinking energy drinks only did so once or twice a week. Only one of the eight said they ate once a day every day for the past two weeks. Similarly, sports drink consumption was found to be quite low on a daily basis, with most of it occurring only once or twice a week.

Table 2: Consumption of energy and sports drinks on a regular basis.

S. No.	No. of drinks per week	Energy drinks*	Sports drinks*
		(n=112) Frequency (%)	(n=112) Frequency (%)
1.	1-2	30 (48.4)	4 (11.8)
2.	>2 but ≤6	18 (29)	27 (79.4)
3.	≥7 (at least once a day)	7 (11.3)	3 (8.8)
4.	Others	8 (11.3)	0 (0)
5.	No Consumption	51 (44.6)	79 (69.6)

Responses do not have to be mutually exclusive

The intake of energy drinks was determined to be 55.4 percent, while sports drinks (30.3 percent) and supplements (43.3 percent) were consumed by the respondents over the previous two weeks. Table 3, on the other hand, shows that among the energy drinks, "Red Bull" is the most consumed drink (45.2 percent). However, 44.6 percent of respondents reported drinking sports drinks, with Gatorade (17.9%) being the most popular.

Table 3: Brands' selection of energy and sports drinks

S.no.	Energy drink brands	Numbers (%) N=62	Sports drink brands	Numbers (%) N=34
1.	Red Bull	28 (45.6)	Gatorade	20 (18)
2.	Tzinga	17 (27.8)	Powerade	9 (8)
3.	Monster	9 (15)	Stamina	1 (0.9)
4.	Power Horse	5 (8.4)	Isotonik	1 (0.9)
5.	Xs energy drink	2 (3.4)	Lucozade	1 (0.9)
6.	Burn	0 (0)	Any other	2 (1.9)
7.	Any other	1 (1.8)	-	-

For energy drink intake, taste, energy boost, and stimulation during exams were cited as some of the most prevalent reasons for energy drink intake. Sports drinks were being drunk by adolescent students who were participating in physical activities such as playing outdoor games, going to the gym, or participating in other fitness activities. Overcoming exhaustion after strenuous activity (53.4 percent), refreshment (28.3 percent), and pleasant flavour were identified as factors in intake (18.3 percent). According to the WHO report cut-off values for Body Mass Index (BMI), over 63 percent of the study subjects were overweight (51.2 percent) or obese (51.2 percent), as shown in Tables 4 and 5. 11.6 percent The link between having a BMI of more than 24.99 and drinking any type of drink was shown to be statistically significant (p 0.001).

Table 4: BMI distribution among patients who drank either type of beverage

Students categories	Numbers (n=43)	Percentage
Underweight (<18.5)	2	4.7
Normal (18.5–24.99)	14	32.6
Overweight (25.0–29.99)	22	51.2
Obese (>29.99)	5	11.6

Table 5: Association of BMI with consumption of either type of drinks

BMI	Consumption of drinks		Total	χ^2 value, df, p value
	Yes	No		
<24.99	16	48	64	11.32, 1, <0.001
>24.99	27	21	48	
Total	43	69	112	

The most popular supplements were multivitamin and mineral capsules (51.2 percent), followed by iron (14%), calcium, vitamin D, and vitamin C (11.6 percent each). Thus, the most commonly ingested vitamins without a prescription were over-the-counter multivitamins, whereas the most regularly consumed minerals were iron and calcium, as indicated in Table 6.

Table 6: Subjects by consumption of multivitamin and nutritional mineral supplements (n=43)

Supplements	Yes (%)
Multivitamin and multivitamin	22 (51.2)
Iron	6 (13.9)
Vitamin C	5 (11.6)
Vitamin D	5 (11.6)
Calcium	5 (11.6)

The most common cause for supplement consumption stated by survey participants was parental counsel. However, none reported supplement consumption as a result of peer/colleague/friend pressure or recommendation. As indicated in Table 7, electronic (television commercials and radio jingles) and print media (such as the internet, newspapers, and magazines) also play a role, particularly in subjects who are concerned about their health.

Table 7: Subjects by reasons of use of multivitamin and nutritional mineral supplements.

S. no.	Reasons	Numbers (n=43)	%
1.	Because parent has advised for taking the supplements	17	39.5
2.	Because you feel it makes up for lack in nutrients of a balanced diet*	4	9.3
3.	Because of the benefits that you read in magazines/newspapers or see in advertisements in TV or radio jingles	3	6.9
4.	Because parent has advised it and of benefits that you read of, on the internet/in magazines/newspapers or saw in advertisements, both	1	2.3

*Students of senior classes of 9 and 12.

Only three people out of a total of 112 said they took protein supplements, with the frequency ranging from once or twice a week to daily, since they needed to gain weight because they were working out to increase lean body mass. Adolescents' usage of energy drinks (55%) and sports drinks (30.4%) is within the range observed in other studies [9, 10, 11]. Because of the increased availability of these items, as well as media influence promising improved performance, the use of energy drinks and supplements is on the rise, particularly among adolescents in China. This could be due to increased availability combined with a higher level of product awareness in the study population [12]. The rates can also be reported to be greater if the study is undertaken in the older age group of adolescents, such as students over the age of 19, as some researchers have included university students [10]. When it comes to intake frequency, the study participants reported consumption anywhere from once or twice a week to every day. The usage of energy and sports drinks was also found to be statistically significant when measured by BMI. The reported reasons for usage, such as the capacity to stay awake during exam time, general energy increase, and taste, appear to be prevalent. The findings are also consistent with those of other investigations [11]. The apparent benefits of these products, according to the students, include an increase in energy and the ability to stay awake during exam time. One student stated that he did not use these products because of the high calorie level in both energy and sports drinks, as well as the high caffeine content in energy drinks. Aside from that, no other students mentioned any specific danger related to their consumption.

Respondents claimed that body weight gain as a result of gymming was a motivation for consumption at only 3%, which was consistent with other studies' findings (3.9%). Due to the strong strain of schoolwork and exams on students, the low proportion could be linked to a smaller number of responders participating in gymming. In addition, like with energy and sports drinks, the sample was limited to students aged 14–19, excluding older college students whose usage may grow. The current study has certain limitations, such as a small sample size, which may restrict the generalizability of the findings. A definitive association with changes in body mass index cannot be predicted due to the tiny sample size. The conversation was limited to specific types of nutritional supplements and concerns related to perceived advantages due to the use of only a limited set of questions.

43 percent of the adolescents in this study were found to take vitamin and mineral supplements. According to the NHANES 2003–2006 survey, 49 percent and 33 percent of people use multivitamins and mineral supplements, respectively. Another study of 78 students found that 56.4 percent drink sports drinks, 48.7% take vitamin and mineral tablets, 42.3 percent (n = 38) drink energy drinks, and 39% (n = 3) drink high-protein milk supplements. As a result, the use of vitamin and mineral supplements in this study was found to be in the same range (43 percent). Additionally, multivitamin and multi-mineral supplements are the most regularly ingested among those who report using these items. In addition, parental suggestion was the most commonly mentioned reason for supplement intake in this study. Parents supplement their children for a variety of reasons, including competition for improved performance, media-generated awareness, and health conscience. It's worth noting that peer consumption doesn't appear to be a significant factor. Research conducted in Australia yielded similar results. As a result, parental counsel appears to be a common element in the consumption of these items around the world.

This suggests that the use of energy and sports drinks is quickly becoming a major issue among teenagers and young people in our country as well. More and more teenagers are experimenting with supplements in order to improve their performance without fully comprehending the consequences of doing so. Such studies should be conducted on a larger scale, with a broader and more diverse population, particularly in terms of age group, in order to gather precise information on the scenario of consumption of these items. Because there has been a substantial link between BMI and energy drink intake, knowledge of this parameter may be communicated among potential customers, as a rise in BMI may be a risk factor for non-communicable diseases later in life. However, this study does provide valuable information about how the media influences people's day-to-day decisions. Thus, rather than supplements and energy drinks, the media should be used to promote long-term, sustainable behaviour change among adolescents and young people for the promotion of a healthy lifestyle and nutrition. There should also be regulations in place regarding the promotion of energy/sports drinks and their sale in school canteens and near school grounds.

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