



Indian J Community Med. 2016 Apr-Jun; 41(2): 151–153.

PMCID: PMC4799639

doi: 10.4103/0970-0218.173501: 10.4103/0970-0218.173501

PMID: [27051091](#)

Caffeine Intake Among Adolescents in Delhi

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Received 2015 Sep 14; Accepted 2015 Oct 8.

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Abstract

Background:

Availability and advertising of caffeinated drinks is on the rise in Indian market. Excess caffeine intake may have deleterious effects on health.

Objective:

To estimate the daily consumption of caffeine among urban school-going adolescents from Delhi.

Materials and Methods:

A school-based survey was conducted to determine the amount and pattern of caffeine consumption among students of classes 9-12, using a self-administered questionnaire.

Results:

Of 300 participants (median age 15 year, 174 boys), 291 (97%) were consuming caffeine [mean (SD): 121.0 (98.2) mg/day]. Nineteen (6%) students were consuming more than 300 mg of caffeine per day. Tea/coffee contributed to more than 50% of the caffeine intake. The rest was derived from cola beverages, chocolates, and energy drinks.

Conclusion:

Average caffeine consumption among school-going adolescents from Delhi is high. The findings of this preliminary survey need to be confirmed in larger data sets.

Keywords: Adolescents, average daily consumption, caffeine, children, India

Introduction

Caffeine is the most widely used psychoactive stimulant among people of all ages and from various cultural backgrounds. Generally recognized as safe by the Food and Drug Administration, excess caffeine intake can result in serious health hazards and, in rare cases, death.^(1,2) Excessive consumption of caffeinated beverages can have a negative effect on health in terms of optimal sleep, overall growth, and development, and the risk for engaging in risky behaviors.⁽³⁾

The prevalence of caffeine intake among adolescents is increasing presumably due to availability of wide range of caffeinated products including colas and energy drinks, apart from the traditional sources including tea and coffee. These drinks contain caffeine levels ranging from 50 mg (equivalent to a can of soda) to 500 mg (equivalent to five cups of coffee). This may also enhance the preference for sweet foods and an overall greater incidence of overweight, obesity apart from the direct effects of caffeine on neural, cardiovascular, gastrointestinal, and renal functions.⁽⁴⁾ Despite having so many effects, no minimal safe limit has been set for caffeine, however, an upper limit of 300 mg/day is recommended for adolescents.^(5,6) Average daily intake of caffeine among adolescents has not been documented in India. This is important for allowing additional caffeine intake, so that the maximum permissible limit is not crossed. We conducted this study to determine the daily consumption and pattern of caffeine intake in adolescents belonging to upper middle socioeconomic group. We also tried to find out the reasons that prompt intake of caffeine in this age.

Materials and Methods

This cross-sectional survey was conducted in three co-educational public schools of Delhi between July and August 2014 after obtaining approval from the Institutional Ethical Committee. Permission was obtained from the school authorities and informed consent obtained from all participants. All students studying in classes 9-12 were approached for inclusion. A questionnaire was administered to those who attended school on the day of survey, in an anonymized manner. The questionnaire recorded the date of birth, gender, and amount and frequency of intake of items containing caffeine like tea, coffee, carbonated beverages, energy drinks, foods, and confectionaries containing chocolates, and miscellaneous snack foods, gums, and mints over a period of 1 week. Participants were also questioned on their awareness of caffeine and reasons for consumption of caffeinated products. Information on the caffeine content of foods, beverages, drugs, and dietary supplements was obtained by reviewing technical publications and the Internet for pertinent data, and by conducting telephone interviews with trade associations and industry experts.^(7,8,9,10) Total caffeine intake was calculated for each subject and averaged for daily consumption.

Results

A total of 300 students (126 female and 174 male) voluntarily agreed to participate in the study and responded to the questionnaire (response rate 75%). The median age (IQR) of included children was 15 (14, 16) years. Consumption of caffeine ranged from 0 to 423 mg/day with a median (IQR) of 96.5 (44.2, 168.5) mg/day [Table 1]. Mean (SD) caffeine intake of the study group was 121 (98.2) mg and a major proportion of it was attributable to coffee/tea. Nineteen (6%) participants were consuming caffeine more than 300 mg/day. Eighty-three percent (83%) students knew that the items (such as tea, coffee, and soft drinks) they were consuming contain caffeine. Caffeine consumptions correlated significantly to increasing age ($r = 0.251$; $P < 0.001$). There was no difference between boys and girls with respect to caffeine intake. The most important reason for taking caffeinated products was to keep more alert and combat drowsiness (47.6%) followed by to combat stress (32%), to increase concentration (22.6%), to combat headache (17.8%), and to help deal with stress and anxiety (14.4%).

Discussion

Our findings indicate that most school-going adolescents belonging to the upper-middle socioeconomic status consume caffeine in one or other manner. Coffee and tea are the most common types of caffeinated drink being consumed. The most common reasons for consuming caffeinated products were to keep more alert and to combat drowsiness.

Frery *et al.* (2005)(7) reported a mean caffeine intake of 69.5 mg per day among US adolescents aged 12-17 years. Another survey on US population, based on the 2009-2010 National Health and Nutrition Examination Survey (NHANES) data reported the average consumption of caffeine among US children as 64.8 (9.8) mg for 12-16 years and 96.1 (7.2) mg for 17-18 years age.(11,12) Another study reported average caffeine intake as 61 (55-67) mg per day in Australian children aged 12-16 years.(13) A study(14) from Canada reported the daily caffeine intake in 8-12 year olds as 109 mg (much beyond the recommended 85 mg/d(15)). Average daily consumption of caffeine in our study population thus far exceeds that reported in developed nations, which is alarming. Most of this caffeine is coming from coffee (frequency 2-3 times per day) since it contains much more amount of caffeine as compared to other beverages.(15) A study conducted in Southeast Asian countries has shown an overall increasing trend towards coffee intake rising at the rate of 4.9% per annum since 2000.(16) Energy drinks that contain maximum amount of caffeine have thankfully yet not penetrated enough in the studied population.

To our knowledge, this is the first population-based study in India to estimate the daily caffeine intake in school-going adolescents from an urban area. The study was conducted on a small sample size and may not represent the adolescent population at large. The heavy reliance on self-reported questionnaires is another weakness of the study. Despite these limitations, the study does point out a probability of higher caffeine intake in urban Indian adolescents compared to the worldwide data. This should act as a trigger for the policy makers to set guidelines for specific upper limits for the caffeine content in various food items and also to recommend daily allowance of caffeine intake among various age groups in India.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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Figures and Tables

Table 1Average caffeine consumption of adolescents ($N = 300$)

Caffeinated item	Number consuming [N (%)]	Caffeine consumption (mg/day) [mean (SD)]
Coffee	191 (63.6)	45.8 (55.8)
Tea	123 (41)	14.6 (26.3)
Coffee/tea	231 (77)	60.4 (62.5)
Cola beverages	237 (79)	21.3 (27.8)
Chocolates etc.	232 (77.3)	29.6 (35.6)
Energy drink	59 (19.6)	9.7 (24.8)
Total	291 (97)	121.0 (98.2)

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