

Caffeine Consumption Among Adolescents in Rural Karnataka

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Abstract

Introduction: Intake of caffeine containing beverages such as coffee, tea or energy drinks is on a rise among children and adolescents. Children are considered more sensitive to caffeine because of continued brain development involving myelination and pruning processes. Children may develop agitation, tachycardia, gastrointestinal disturbance, nausea and diuresis because of caffeine toxicity. This study was conducted to find out the daily consumption of caffeine in adolescents and to determine the reasons that prompt its intake.

Material and methods: It is a prospective observational study which was conducted in Rural Karnataka at Adichunchanagiri Institute of medical sciences during the period of 1st June 2020 to 31st December 2020. All adolescents availing the Pediatric OPD services during the study period constituted the study sample which was of 250.

Results: 250 adolescents participated in the study out of which 135 were males and 115 were females. Caffeine consumption ranged from 0 to 358mg/day. The mean caffeine intake of group of participants was 103mg, of which coffee and tea contributed the most. The most common reasons for taking caffeine items were along with adults as part of daily routine (60%), to tackle drowsiness and be alert full (20%), to increase concentration (18%) followed by to reduce headache (15%).

Conclusion: In our study we found that the most common caffeinated items consumed were tea and coffee. The most common reason for consuming caffeinated items was as part of daily routine along with adults. Adolescents usually don't have much knowledge regarding the sources, effects and hazards of caffeine which is important factor in its use among them. Its high time that the policy makers set specific guidelines for the upper limits of caffeine in various food products and also recommend daily allowance of caffeine intake for the various age groups, especially children.

Keywords: Caffeine; Adolescents; Rural; Caffeine consumption.

Introduction

Worldwide, Caffeine intake is a part of socialization and culture which is encouraged and promoted as a result of which almost 90% of adults are habitual caffeine users.^{1,2}

Safety of coffee consumption by the adults in the form of hot drinks has been confirmed by the recent studies.^{3,4}

Studies have shown risk of type 2 diabetes, liver, uterine or prostate cancer can be reduced by coffee

intake. Risk of neurological and cardiovascular diseases was also shown to reduce.⁵

However, individual characteristics, such as, age, body weight, gender, dose consumed determine the safety of caffeine which is the main stimulant present in coffee.^{3,6}

Intake of caffeine containing beverages such as coffee, tea or energy drinks is on a rise among children and adolescents.⁷

Even though US food and Drug administration considers caffeine a “safe” substance, as most of the research has been done in adult population, the potential adverse effects on children and adolescents are largely unknown.⁸

Children are considered more sensitive to caffeine because of continued brain development involving myelination and pruning processes.^{9,10}

Children and young persons caffeine use may lead to sleep dysfunction, elevated blood pressure, increased alcohol use and impairments in mineral absorption and bone health.¹¹⁻¹⁴

As sugar-sweetened beverages most of the times contains caffeine, it may lead to dental cavities and weight gain.¹⁵

Children may develop agitation, tachycardia, gastrointestinal disturbance, nausea and diuresis because of caffeine toxicity.^{13,16,17}

For adolescents an upper limit of 300mg/day is recommended, but despite having so many effects no minimal safe limit has been set for caffeine.^{18,19}

This study was conducted to find out the daily consumption of caffeine in adolescents and to determine the reasons that prompt its intake.

Material and Methods

Study Place	Study was conducted in Tertiary Rural Care Hospital i.e., Adichunchanagiri Institute of Medical Sciences.
Study Duration	From 1 st June 2020 to 31 st December 2020.
Study Subjects	Adolescents of the age group 10-17 years availing Pediatric OPD services.
Study Design	Prospective Observational Study.
Study Size	All the adolescents who availed Pediatric OPD services were included in the study.

Informed consent was taken from all the participants. A preformed questionnaire was administered to all the participants which contained age, gender, personal experience with caffeine consumption [frequency of drinking and the amount consumed,

expressed as small (100 mL) and big (200 mL) cups for hot drinks or glasses (200 mL) for cold drinks, consumption of confectionaries containing chocolates and other miscellaneous food items over a period of 5 days.

Participant’s caffeine awareness and reason for caffeine intake was also questioned.

Caffeine ingestion was calculated based on the type of beverage consumed, the amount consumed, and published contents of these beverages.

Results

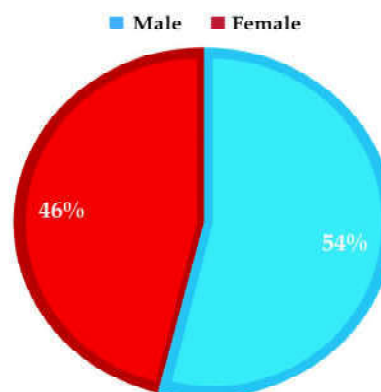


Fig. 1: Gender

250 adolescents participated in the study out of which 135 were males and 115 were females. The Median age of included participants was 13.5years.

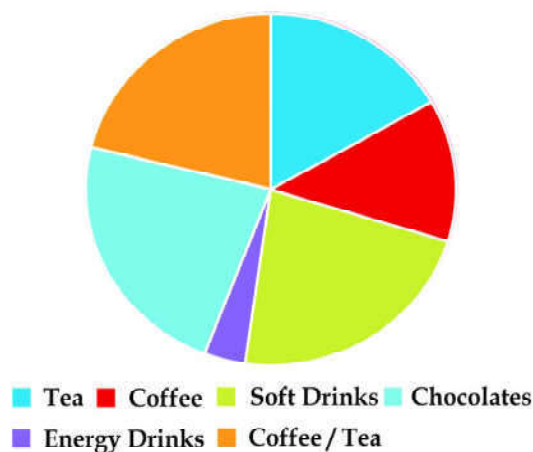


Fig. 2: Number of Adolescents Consuming

Caffeine consumption ranged from 0 to 358mg/day. The mean caffeine intake of group of participants was 103mg, of which coffee and tea contributed the most. 12 participants (4.8%) consumed caffeine more than the upper limit of 300mg/day.

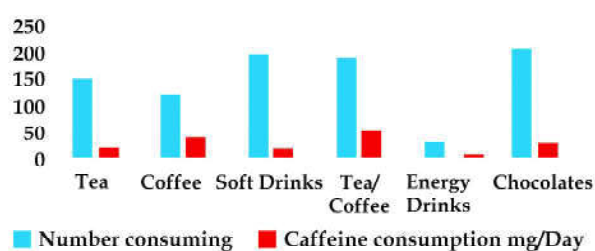


Fig. 3: Caffeine consumption range

Table 1: Caffeine consumption.

Average coffee consumption of adolescents (N=250)	Number of adolescents consuming/(%)	Caffeine consumption per mg/day(mean)
Item		
Tea	148(59.2%)	20.3
Coffee	120(48%)	38.6
Soft Drinks	201(80.4%)	18.7
Tea/Coffee	190(76%)	51.4
Energy Drinks	32(12.8%)	7.6
Chocolates	205(82%)	27.2
Total	250(100%)	103

Only 44% of adolescents knew that the items they were consuming contained caffeine.

There was no difference in caffeine intake in boys and girls.

The most common reasons for taking caffeine items were along with adults as part of daily routine (60%), to tackle drowsiness and be alert full (20%), to increase concentration (18%) followed by to reduce headache (15%).

Discussion

In our study we found that the most common caffeinated items consumed were tea and coffee. The most common reason for consuming caffeinated items was as part of daily routine along with adults.

Ewa Blaszczyk-B?ebenek et al²⁰ conducted a study among adolescents in South East Poland in which they found average caffeine intake was 95.54 mg/day. The average caffeine intake with diet in the study group of 14–19 years old was 61 mg per day in a study done by Drewnowski et al²¹ on US adolescents.

In other studies conducted in USA, the average caffeine intake among adolescents varied from 53 up to 228 mg/day.²²⁻²⁴

In Croatia²⁵ and Poland²⁶ the values were 63mg/day and 141mg/day respectively and it went upto 190mg/day as per the studies conducted in UK²⁷.

In Canada a study²⁸ found the daily caffeine intake in 8-12 years as 109mg which was similar to our study

which is more than the recommended 85mg/day²⁹.

A similar study was conducted by Gera M et al³⁰ among the adolescents living in Urban Delhi which found the average caffeine intake of 121mg/day which was more than our study.

In current era adolescents are regularly confronted with aggressive advertising of beverages which contain caffeine but don't reveal the caffeine content and adverse effects which may arise because of its excessive use³¹⁻³².

Adolescents usually don't have much knowledge regarding the sources, effects and hazards of caffeine which is important factor its use among them.

Thankfully energy drinks which contain the maximum amount of caffeine in them has still not penetrated enough in our adolescent's population.

To the best of our knowledge, this is a first population based study done in Rural Karnataka to estimate the average daily consumption of caffeine. Small sample size and heavy reliance on questionnaires are the weakness of this study.

Its high time that the policy makers set specific guidelines for the upper limits of caffeine in various food products and also recommend daily allowance of caffeine intake for the various age groups, especially children.

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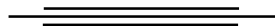
Conflict of Interest: There are no conflicts of interest.

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