

PATTERN AND IMPACT OF TEA CONSUMPTION ON ACADEMIC PERFORMANCE OF MEDICAL STUDENTS

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ABSTRACT

Objective: This study was conducted to explore the pattern of tea consumption among medical students and to determine the association between tea consumption and academic performance of medical students.

Design: Cross-sectional study.

Place and Duration of Study: This study was carried out at HITEC-IMS, Taxila from January to June, 2020.

Material and Methods: One hundred & twenty five students from 1st Year to 4th Year MBBS were invited to participate in this study through convenience sampling. Structured proforma was used to collect data after informed consent. Data were analyzed using SPSS version 26. Mean and standard deviation was calculated for continuous variables like age. Frequencies were calculated for categorical variables like year of study, no of tea cups consumed per day. Chi square test was applied to determine existence of association between different variables and p value was taken significant at < 0.05 .

Results: Response rate was 92% among total of 1116 participants. The mean age of participants was 21.1 Years ($SD=1.34$). 98.2% ($n=114$) respondents were tea consumers. Dhood patti (tea with more milk) was the preferred type of tea ($n=55$, 47.4%). Change in tea consumption during examination was reported by 56.9% ($n=66$) students. 45 (38.7%) students reported to have one cup tea daily, whereas 51 (44.7%) were having 2-3 cups daily. 42 (36.2%) students thought consuming tea increased their academic performance. Seven (6%) said that their performance decreased by tea consumption while 67 (57.8%) students said that tea had no impact on their academic performance. However, statistically insignificant association was found to exist between tea consumption and academic performance among medical students.

Conclusion: Tea is extensively used among medical students to increase alertness, vigilance and to cope stressful academic schedules and assessments with an intension to perform better. However, its use was not associated with better academic performance.

Students must be educated regarding harmful effects of excessive use of tea and its safe alternatives like decaffeinated tea.

Keywords:

Academic performance, Medical students, Tea

INTRODUCTION

Tea contains caffeine, a CNS stimulant that belongs to Methyl Xanthine organization. It is the widely consumed beverage by two third of world's population. Tea consumption is highly prevalent among college students.¹ Globally, per year, over 120000 tons of

caffeine is consumed counting for approximately 70mg per person per day. More than 19,000 studies have been conducted in the past 30 years to explore the effects of caffeine on human body.² Many beverages like tea, carbonated soft drinks and energy drinks, chocolate and other cocoa-containing foods contain caffeine, however the major source of its consumption is tea particularly among 14–21 years age group. Amount of caffeine prescribed by European Union is 400mg for adults. One cup of tea comprises of 35–61 mg caffeine and 4.5–22.5 mg theanine. Consumption of tea also has an acute positive effect on stress relaxation which gives evidence

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of reduced cortisol level whereas it shows no impact on blood pressure and heart rate.³

Based on the knowledge currently available positive as well as negative, physical and psychological effects of tea have been observed. The acute effects of tea have been attributed to caffeine and theanine while the chronic effects have been associated with other components in tea, such as flavonoids. Caffeine has a stimulant effect and its utilization can increase attentiveness and cautiousness. There is also an association of taste and smell of caffeine with its initiated mood changes.⁴ A study carried out by Aga Khan University revealed that 52% of medical students consumed tea to perform outstanding tasks and for attention improvement. In recent studies, the expectation of using tea and caffeine is higher in medical undergraduates. Medical students face tough routines regarding their study and examination, for this reason they lean towards tea.⁵ Another survey reported that consumption of tea is favorable for good health involving elevation of mood, reduce anxiety, calming effect, stress-reducing effect, attention improvement, reducing risks of cardiovascular disease. Regular intake of tea has a beneficial psychological effect and provide greater performance which is associated with brain connectivity.⁶ It has been demonstrated that caffeine defers the beginning of sleep and upsets rest patterns. Various studies demonstrated that consecutive use of caffeine helps in reducing stress.⁷ Routine caffeine use may have remarkably unfavorable impacts on students. Several natural and behavioral changes are observed among youth which is related to certain sleep patterns and use of substances such as alcohol and marijuana. Some studies suggested that consumption of caffeine in the early years of age leads to the use of such substances. Young students use caffeine with the habit of smoking and heavy intake of alcoholic beverages.⁸ The National Health and Nutrition Examination Survey (NHANES) of U.S showed that 89 % of adults regularly take caffeine, upon asking from adults and students they reported that the use of caffeine boosts their energy.⁹ A study revealed that gargling with black tea extract has a preventative role in controlling influenza infection among high school students.¹⁰ Medical students have hectic academic schedule and extensive assessments. Generally, the consumption of caffeinated drink among students is increased to manage this load and to perform better. Literature is deficient in establishing the relationship between this increased consumption and academic performance particularly in local context. This

study was intended to determine the association between tea consumption and academic performance of Medical Students of HITEC-IMS.

MATERIALS AND METHODS

This cross-sectional study was conducted from January to June, 2020 at HITEC-IMS, Taxila. Students of different years of M.B.B.S studying at the Medical College were included in study. Purposive sampling technique was used to collect the data. WHO sample size calculator was used to estimate sample size. By using the proportion of 94%⁷ tea consumption among medical students with .05 margin of error and 95% confidence interval, calculated sample was 120. Approximately 125 students were contacted to participate in the study but viable questionnaires were submitted by 116 students. The academic record of previous EOB (End of block) examination was taken from the Student Affairs Department. Students having supplementary or end of block examination at time of data collection were excluded. A structured questionnaire developed after extensive literature review comprising of two sections was used to collect data. 1st section was related to demographic profile of respondents and second section comprising of sixteen questions assessed the pattern of tea consumption and its impact on academic performance, stress, memory, alertness level and sleep during exams. Students consuming at least one cup per day were operationally defined as consumers. Since the amount of caffeine was not measured, therefore depending upon the method of its preparation, tea was categorized into black tea (Strongest), strong tea (strong), separate tea (medium) and dhoo patti (mild). Pattern of tea consumption over a period of three months preceding the examination was inquired. Questionnaires were filled by respondents themselves after informed consent and assurance of confidentiality of responses. Data were analyzed using SPSS version 26. The mean and the standard deviation were calculated for continuous variables. Frequencies were calculated for categorical variables. Chi square test was applied to determine association between academic performance and tea consumption. p value was taken significant at <0.05.

RESULTS

The response rate by participants was 92.8%. Out of total 116 participants, majority were females (n=75, 64.7%) and males were 35.3% (n=41). The mean age of participants was 21.1 Years (SD=1.34). Age of respondents ranged from 18-25 years. Out of the 116,

44.8% (n=52) were boarders and 55.2% (n=64) were non-boarders. Majority of the participants were from 4th Year MBBS (n=53, 45.7%) followed by 3rd Year (n=29, 25%), 2nd Year (n=25, 21.6%) and First Year (n=9, 7.8%)

Table I: Tea consumption status according to gender, Year of study and residence

Variable		Tea Consumption		P value
		Tea Consumers	Non-Consumers	
Gender	Male	40 (97.5%)	1 (2.4%)	.66
	Female	74 (98.6%)	1 (1.3%)	
Year of Study	1 st Year	9 (100%)	0	.69
	2 nd Year	24 (96%)	1(4%)	
	3 rd Year	29(100%)	0	
	4 th Year	52(98.1%)	1(1.8%)	
Residence	Boarded	51 (98.08%)	1 (1.92%)	.88
	Non-Boarder	63 (98.44%)	1(1.56%)	

Regarding pattern of tea consumption, 98.2% (n=114) participants used tea on regular basis both in the morning and evening. Tea type preferred by majority of students was Dhood Patti (n=55, 47.4%), followed by strong tea (n=33, 28.4%), separate tea (n=15, 12.9%) and black tea (n=4, 3.4%). Only 7 (6%) students reported to take tea in other forms. 56.9% (n=66) students reported to change their tea consumption pattern during examinations, whereas 43.1% (n=50) reported no change.

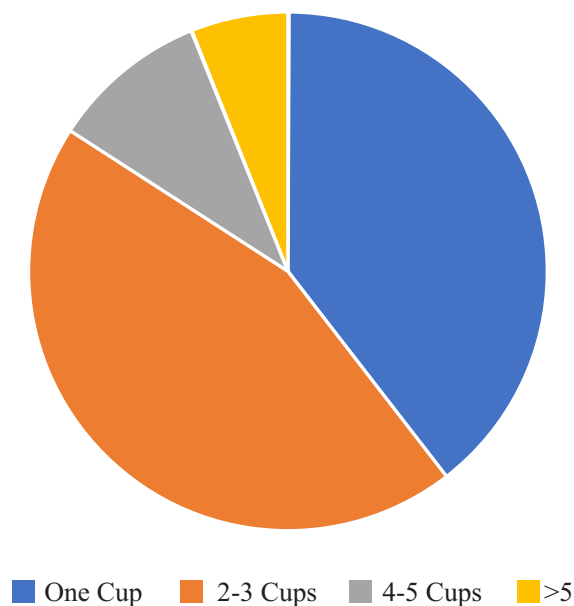


Fig.1: No of tea cups consumed by students per day

Regarding effect of tea on academic performance, more than half of participants reported that using tea doesn't influence their academic performance.

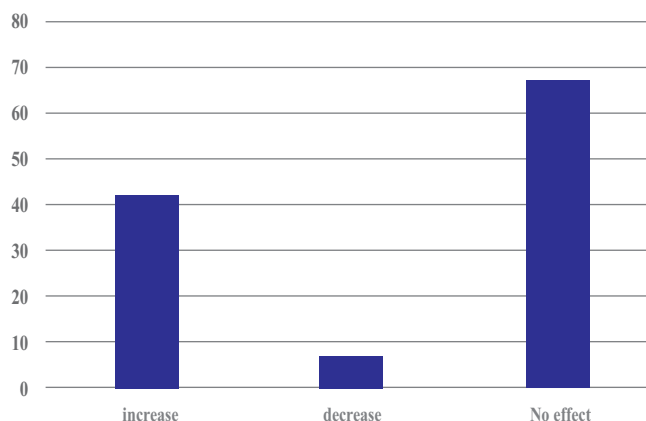


Fig.2: Effect of tea on academic performance

Statistically insignificant association was found to exist between tea consumption and academic success and percentage of marks scored. Similarly, statistically insignificant association was observed between number of tea cups consumed and academic success and percentage of marks scored.

Table II: Relationship between tea consumption and academic performance

Dependent variables		Consume Tea		P value
		Yes	No	
Academic performance in previous professional Examination	Pass	110	2	.93
	Fail	4	0	
%age of marks scored	50%	4	0	.95
	51-55%	2	0	
	56-60%	10	0	
	61-65	21	1	
	66-70	39	0	
	71-75	24	0	
	76-80	9	0	
	80	5	0	

Regarding reasons to consume tea, 66(56.9%) students said that they take tea to relieve stress while 50(43.1%) students said their stress is not relieved by tea consumption. Seventy four students (63.8%) consumed tea to stay alert. 32(27.6%) of students thought their memory was affected by tea consumption. Twenty one students (18.1%) think they perform better than non-consumers, 68(58.6%) thought tea increased their concentration. Regarding sleep pattern among tea consumers 25.8% (n=32) reported to sleep for more than 8 hours, followed by 43.1% (n=50) to sleep for 6-7 hours, 24.5% (n=28) had 4-5 hours' sleep and only 5.2% (n=6) had 2-3 hours of sleep.

DISCUSSION

In our study, we found that majority of students took tea regularly. These findings are similar to a study conducted at Dow University of Health Sciences Karachi which reported caffeine consumption by 94% of the students while 67% consumed tea.⁵ Same study reported that 71.5% of students considered improvement in academic performance by caffeine consumption. Reports from Iran also show that tea was the most commonly used beverage among students.¹¹ In a study conducted in Taiwan, 36.1% of new university students consumed tea regularly. New undergraduate students took less tea as compared to postgraduate students.⁷ Our study mainly included students from 3rd and 4th year MBBS, which could be a reason for the high percentage of tea consumers in this study. Another possible reason is the unavailability of other caffeinated drinks at the campus. Most of the students take tea in the morning and evening. Other forms of caffeine intake were not explored in this study. Caffeine was documented to be consumed in form of soft drinks (28.6%), Coffee (22.5%), energy drinks (14.3%) and tablet (0.9%) form in addition to tea (33.8%).¹

In this study 36.2 % of students thought that tea consumption increased their academic performance, 6.03 % of students said that their academic performance decreased by tea consumption while 57.76% said that their performance was not affected by tea consumption. 26.67 %, 43.1%, 45.45% of students who took 1 cup, 2-3 cups, 4-5 cups respectively reported that their tea consumption had a positive effect on their academic performance, 18.1% of tea consumers thought they performed better than non-consumers. Those who did not take tea reported that their academic performance was not affected by tea. Ninety six and half percent of students cleared their last exam and among those 33.6% said their performance is increased by tea. Among the 4 students who didn't pass their last exam, three considered positive while one reported negative effects of tea on academics.

According to research 52% of medical students of Agha Khan University consumed caffeinated products to increase their productivity.¹² Another survey conducted at medical students in Istanbul showed that the majority of medical students believed their academic performance increased by caffeine consumption.¹³

Around 57% of the students changed their tea consumption patterns during exams. There were multiple reasons for this change in tea consumption

patterns; most important was that students believed tea helped them in staying awake and alert. These results are supported by another research conducted at the University Puerto Rico Medical Sciences Campus that says two-third of students consume caffeinated beverages to stay awake during exams.¹⁴ Other studies also reported a high intake of caffeinated drinks among students at times of academic stress.¹⁵

In our study 63.8% of students consumed tea to stay awake and alert. According to research conducted at US students, 79 % of consumers took caffeinated drinks to stay awake.⁹ Other researches also suggested that many young people were taking caffeine to stay awake. Studies have shown positive effects of tea on attention and alertness.^{2,8}

In our study 56.9% of the students in our study consumed tea to alleviate stress. Nine percent of US students took caffeinated products to relieve stress. Around 27.6% of the students thought their memory was affected by tea consumption, 58.6% thought that tea increased their concentration, 31% from USA students reported intake of caffeinated drinks to increase their alertness.⁹ This difference can be attributed to more tea consumption in the Indo-Pak region. However, consumption of a high amount of caffeinated products particularly coffee has been identified as a risk factor of stress and anxiety in school students.¹⁶

We studied the effects of tea on sleep hours of students. Most of the students who consumed tea used to sleep for 6-7 hrs a day, 5.2% of students slept for 2-3 hrs, 24.1% for 4-5%, 43.1% for 6-7hrs and 27.6% students slept for more than 8 hrs. A study conducted by Unno K, revealed that those who consumed caffeinated products had fewer sleep hours than non-consumers.¹⁷

CONCLUSION

Tea is extensively used among medical students to increase alertness, vigilance and to cope stressful academic schedules and assessments with an intension to perform better. However, its use was not associated with better academic performance.

Students must be educated regarding harmful effects of excessive use of tea and its safe alternatives like decaffeinated tea.

Limitations

Subject selection was based on convenience. Most of the participants had good academic records. A study on a group with varying academic performance could better

explain tea effects. Other factors that could affect academic performance like lifestyle, eating habits, and study hours were not considered. The amount of tea consumption was assessed by the number of cups per day rather than the actual amount of tea ingredients in the cups. Questionnaire used for this study should be validated for future researches to establish association between tea and academic performance. The study was conducted on MBBS students of HITEC-IMS only and therefore the results cannot be generalized.

Recommendations

Moderate amount of caffeine consumption in form of tea is found to influence the mental alertness, cognition and mood. However, its role in academic performance in controlled environment is yet to be established. Excessive use of caffeinated beverages may cause addiction. Therefore, students must adopt a healthy lifestyle and consume a moderate amount of tea or preferable decaffeinated products.

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