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CAFFEINE EFFECT ON PHYSICAL AND MENTALHEALTH OF COLLEGE STUDENTS

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ABSTRACT

In Western Population, the caffeine intake of young adults has received significant attention in the research literature; our knowledge in other societies remained limited. The objective of this research is to quantify the amount of ingested caffeine and how this is related to measures of physical and mental health in college students of Indian subcontinent. A semi- quantitative food frequency questionnaire was used to estimate caffeine intake from coffee, tea, coke, energy drinks, chocolates. Associations between caffeine intake, demographic variables and 7 symptoms measured using the Hopkins Symptoms Checklist-25 were examined. A convenience sample of university students in India (n = 250) was surveyed. Caffeine, in any form, was consumed by 90% of students. Mean daily caffeine consumption was 108 mg/day, with males consuming more than females. Coffee was the main source of caffeine intake, followed by tea and chocolates. Participants consuming 100 mg/day or more showed a statistically and significant positive effects on the physical factors. The prevalenceof caffeine intake among university students in India is low. The overall mean intake of caffeine from all sources by university students was within levels considered to be acceptable by many dietary recommendations.

KEYWORDS:- Caffeine, University, India, Diseases, Variables, Performance, Demographic, Participants.

INTRODUCTION

Caffeine is the most widely consumed central nervous system stimulant in the world andone of the most extensively studied elements in the human diet. Caffeine can be ingestedin foods made from natural sources such as coffee, tea, and chocolates. However,synthetic caffeine is

often added to food products and beverages to enhance their stimulant properties. Several studies have quantified the ingested caffeine by adults. Estimates suggest that adults consume a daily average of 180–190 mg caffeine, which is about two to three cups of coffee. Coffee appeared to be the major source of caffeine, followed by tea and soft drinks.

Undergraduate university students comprise a sizeable portion of the younger population and go on to wield a considerable degree of influence in society through the key roles adopted in the future as professionals, senior executives and politicians. The latest report showed that 62% of the young adults in countries were enrolled in tertiary education at universities. The health and well-being of this population group is important, not only due to their potential societal influence, but because many lifestyle related attitudes and habits are formed at this stage and persist across the life span.[1]

The popularity of caffeine stems from the various subjective benefits that individuals associate with its intake; these include increased attentiveness and alertness, increased work performance, enhanced vigilance, elevated mood and delayed onset of sleep. Different populations use caffeine for various reasons; for example, doctors and surgeonsuse caffeine to reduce fatigue and increase alertness, athletes use caffeine to enhance their physical performance, while young adults use caffeine to get more energy, or for the taste, or as part of social gathering or for image enhancement.

Several studies showed that consuming a moderate amount of caffeine has a protective effect against cancer, diabetes mellitus type 2, inflammatory diseases and pain, Parkinson's and related neurodegenerative diseases, cardiovascular disease, and stroke. Light to moderate caffeine intake has also been found to be associated with reduced risk of death from all causes, including suicide.[2]

Coffee intake varies worldwide: Nordic countries have the largest intake: people in Finland, Norway, Iceland, Denmark, and Sweden consume an average of 12 kg, 9.9 kg, 9.0 kg, 8.7 kg and 8.2 kg of coffee per capita per year, respectively. Our knowledge of other societies remainslimited.

However, intake of caffeine in high doses may lead to adverse effects on health. A recent systematic review identified several unwanted symptoms associated with a high daily intake of caffeine; these include palpitations, headache, tremors, anxiety, agitation, restlessness, and

sleep problems.[3]

Research also shows that university students might be at a particularly high risk of adverse effects due to their high intake of caffeine. For example, high caffeine use by university students is associated with sleep problems, particularly poor sleep duration and quality as well as excessive daytime sleepiness. University students who are trying to control or lose weight are more likely to consume higher amounts of caffeine. Binge alcohol drinking is also associated with the intake of energy drinks and other caffeinated beverages by university students.[4]

Taking all of the above information collectively, it becomes clear that more research is necessary to study the overall intake of caffeine and its potential cumulative effects on physiology and behavior among populations vulnerable to its negative effects. Given the absence of previous research that focuses on the quantification of caffeine intake, its sources and its impact on health among Indian university students; the topic warrants further attention.

The current study aimed to assess caffeine intake from a wide variety of caffeinated products, including beverages, chocolates, gums among a convenience sample of university students in India. The presence and severity of some physical and mental symptoms were assessed using the questionnaire. Associations between caffeine intake and symptomatology and selected socio-demographic variables such as sex, resident, and anthropometric variables were examined.[5]

MATERIALS AND METHODS

Study design

The cross-sectional research design was used to assess caffeine intake from a wide variety of caffeinated products, including beverages, chocolates and the physical and mental effects that were experienced by a convenience sample of university students in India between the age group of 17 to 28.

Setting and Participants

The study was conducted using an online survey in April 2022. A convenience sample of university students was recruited through an online information weblink circulated using the social network platforms Whats App and Facebook. A link to the questionnaire in an English

language Google Forms format was initially posted on several Whats App chat groups and Facebook page of college students who are pursuing various degree and diploma courses in different universities across India. When the students clicked on the link, they were taken to the electronic Google Form. Google Form saves each completely filled questionnaire in the investigator's Google drive. Upon completing the questionnaire, the students were asked to forward the survey link to their Whats App Study groups/siblings/partners who are enrolled in higher studies. All the completed forms were available to view on the drive, which was password-protected and could be downloaded when needed for analysis. Only students who were not enrolled in any program at a university located in India or those who were not willing to participate and providing informed consent were excluded. Participants were able to answer the questions within their own time frame, enabling them to have privacy or choice of space.

Based on previous studies and with the reference to the analytical data obtained fromvarious research studies, it was found that a response rate of 50% through survey from a targeted population can be considered eligible for the research studies.

The survey questionnaire was forwarded in various university college group, it was estimated that around 450 students were provided with the questionnaire out of which we obtained a response rate of 58% and deducting the error percentage of 2% which includedincomplete information and errors, it was found that a total number of 250 responses that is around 56% is a considerable and viable number for obtainingthe research studies data.[6]

Tools and Techniques

An English language, self-administered questionnaire was used to collect the data. The questionnaire consisted of structured, closed-ended questions. There were no open- ended or continuing questions, making the questionnaire simple and quick to answer; the investigator estimated that it would take each participant around 5 to 7 minutes to complete their form based on a pilot test activity. The questionnaire was divided into several domains which includes socio-demographics, qualification, daily caffeine intake, physical and mental effects observedafter caffeine consumption.[6]

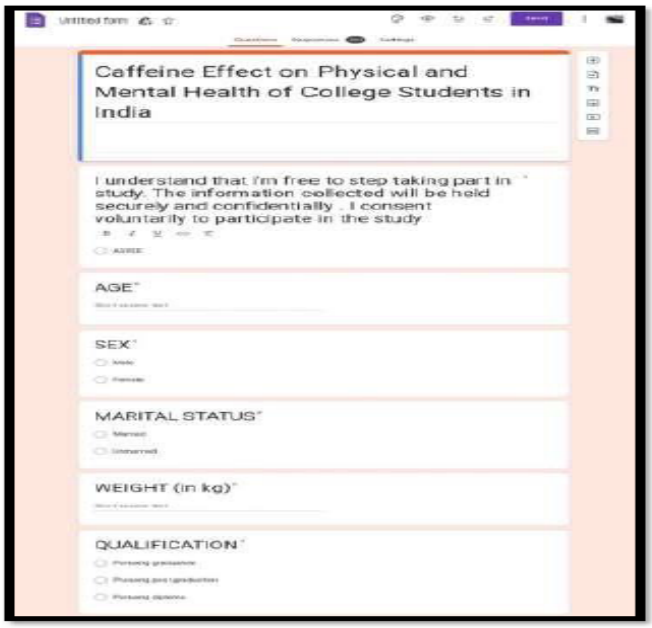

Fig. 3.1: Specimen copy of digital survey form.

Link:- (https://forms.gle/V8KKvK5Nov42fFyz9)

Variables

As described above, the survey collected data on a number of socio-demographic and other parameters. These included: sex, marital status, age and self-reported anthropometrics (weight). Self- reported measurement has been found to be both valid and reliable when compared to measurements taken directly. Qualification of the students was also included in the survey questionnaire, this helped in analyzing the level of study which is being done by the participant. Accommodation details of participants were also collected so as to analyze the pattern of their routine of caffeine intake.

The self-report survey instrument included detailed semi quantitative food frequency questionnaire questions on types of caffeine-containing products consumed, and the serving size and the frequency of intake. A diverse variety of 6 caffeine-containing items were included as a response option in the caffeine intake section. The caffeine-containing items were: coffee, green tea, cocoa, energy drinks, soft drinks (sodas/fizzy drinks), chocolates, tea. Based on the information reported on product type and serving size, the daily caffeine intake was calculated using data on the amount of caffeine in each specificproduct.

For evaluating the effects observed after caffeine consumption 7 parameters (attention, excitation, tiredness, performance, faintness, headache, heart rate) were mentioned in which three options were given based on the experience of the participant, the response were

increasing, decreasing and and no effect. Based on the response given by the participant we can evaluate the parameters in correspondence with the frequency of caffeine consumption in the particular response group by statistical studies.

A symptom checklist for mental effects was also designed which consists of 7 different mental parameters (suddenly scared for no reason, feeling fearful, nervousness, blaming yourself for things, worrying too much, feeling lack of interest in activities, feeling of loneliness). The participants responded based on their experience after caffeine consumption, the response options were “Not at all”, “A little bit”, “Quite a bit”,“Extremely”. Out of these four options given “Not at all” was considered normal while “A little bit”, “Quite a bit”, “Extremely” were considered symptomatic.[7]

Sociodemographic characteristics

Age

The above data represents age of the participants in the survey, in the survey questionnaire an age range of 17 to 28 years was given because it was estimated that most of the college students falls in these age group and it satisfies the requirement for the research studies.

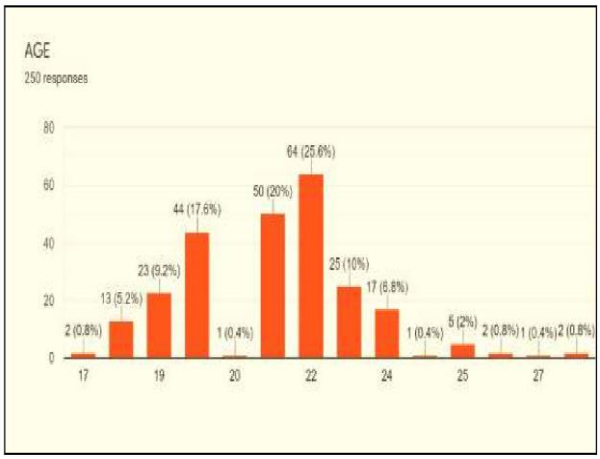

Fig. 5.1:- Age of participants.

Sex

The given data represent the number of male and female participation in the survey, data obtained shows that 162 males and 88 females took the survey, the number of male participantswas more in comparison to female participants.

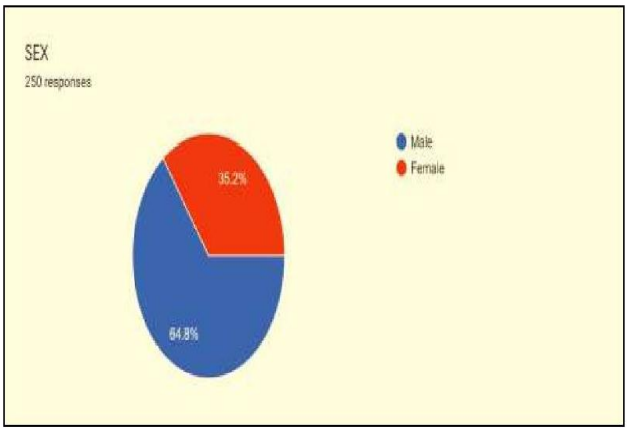

Fig. 5.2:- Sex of participants.

Weight (In kgs)

In the survey questionnaire weight of the participants was collected, the statistical data obtained showed that the participants weight lies in the range of 45 to 115 kgs. An average weight of 64 kg was obtained on calculating the average weight for all participants (n=250).

Fig. 5.3:- Weight of participants.

Residence

The given data gives the residential details of the participants, this data comprises of the information of residing place of the participants, this information is important because it has a direct impact on frequency of caffeine intake according to the residing environment of the participant.

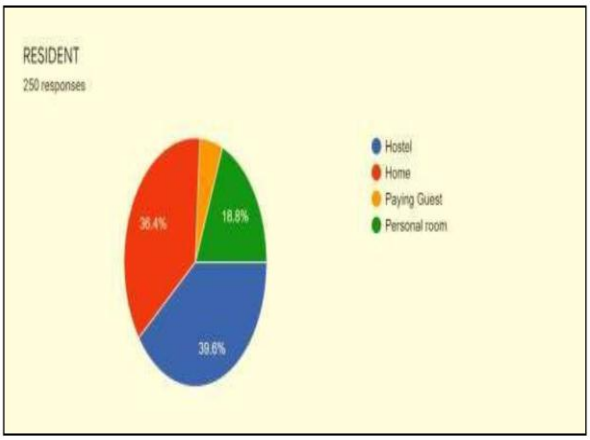

Fig. 5.4:- Residence details of participants.

Smoking

In the survey questionnaire smoking frequency of the participants was recorded. Smoking impacts caffeine effects directly as well as indirectly in then body, in some cases it is observed that person who smokes regularly consumes more caffeine in comparison to normal person.

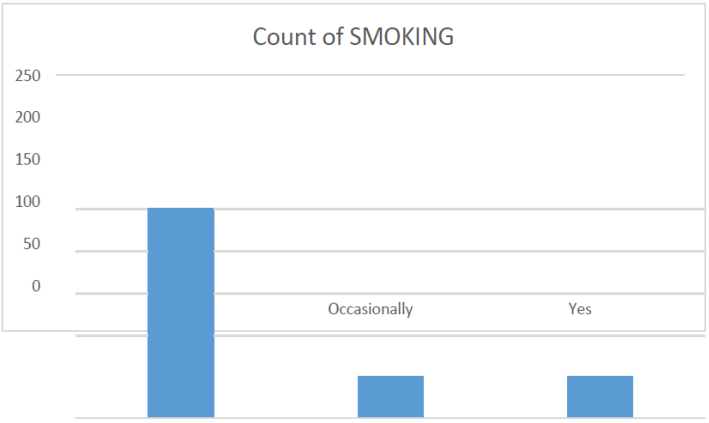

Fig. 5.5:- Smoking details of participants.

Alcohol consumption

The given data provides information about the consumption of alcohol among the participants. It is a considerable factor because alcohol consumption also impacts on caffeine effects to some extent.

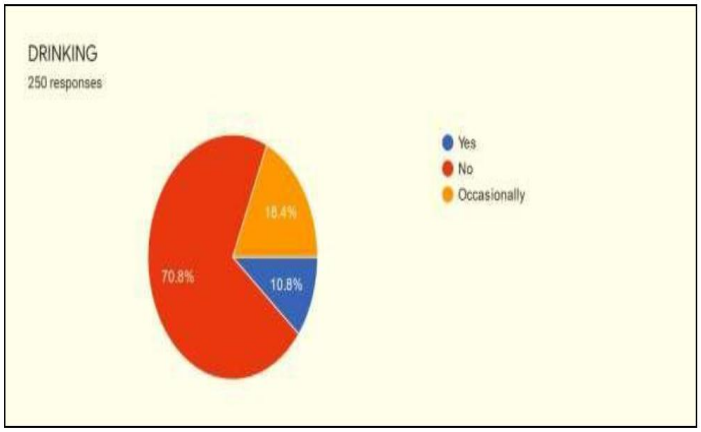

Fig. 5.6:- Alcohol consumption.

Types of caffeinated products consumed

In the survey, it was found that most of the participants consumed coffee, approx. 70% of the participants consumed coffee as the main source of caffeine intake. Tea lies after coffee in consumption rate, approx. 65% participants consumed tea, followed by chocolates, coke, energy drink, green tea. The least consumed drink was green tea only 12% participantsconsumed green tea.

Coffee has its different forms in which it is consumed, and this forms varies in the caffeine percentage present in them, it is because in India from region to region the concentration of coffee used varies according to the environmental condition due to which it is difficult to predict the exact amount of caffeine consumed by any product.

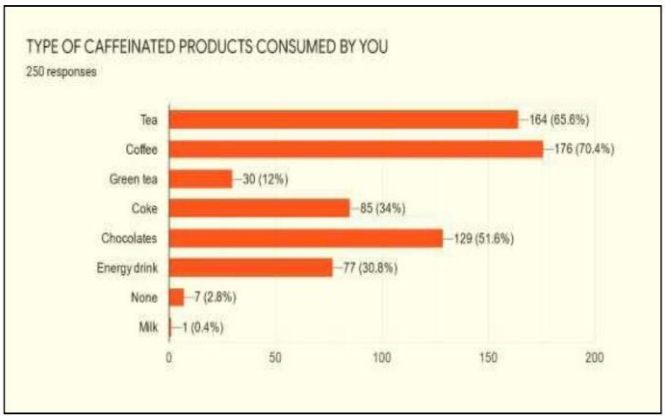

Fig. 5.7:- Types of caffeinated products consumed.

USFDA has mentioned 400 mg/day of caffeine as a safe quantity for consumption ina day, an increase in the amount of caffeine intake than the safe range will certainly have some effects on the physical and mental health of an individual. These changes in the health

conditions are shown up in the course of time, it is not necessary that it will give negative effects although it won't give any positive effects in the course of time. [8]

Caffeine intake (Time Period/Frequency)

Time period of caffeine intake from the participants was recorded. In this it was observed that 49.2% participants consumed caffeine containing products in morning, 15.2% in afternoon, 38.4% in evening and surprisingly 41.2% consumed caffeine occasionally.

The above data suggests that maximum participants consume caffeine to start their day. 41% participants who consume caffeine occasionally may take it due to some social and environmental factor, this can be a major reason for the non-uniform pattern of caffeine consumption.

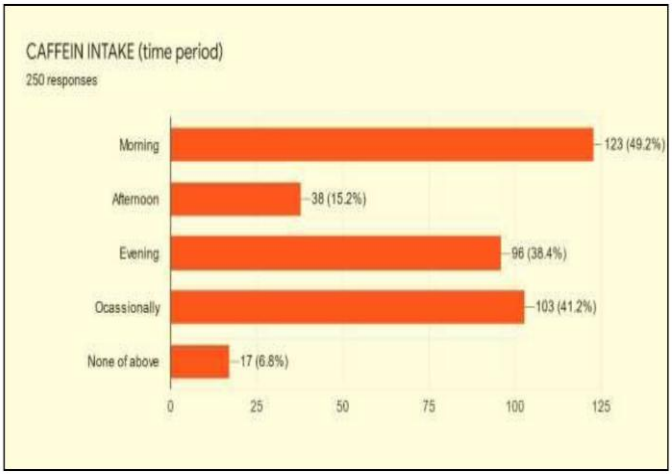

Fig. 5.8:- Caffeine intake frequency.

Around 6.8% of participants reported that they do not consume caffeine in any of the given periodic intervals. This suggests that the participants who comes under this category either do not consume caffeine at all or they do not know their pattern of caffeine intake.

This data is very important for consideration because in accordance with the further questions it will be used as a key tracker for the identification of the pattern and conditionswhich leads to caffeine intake.

Number of servings of caffeine products

The number of servings consumed per day by the participants was recorded in the surveyquestionnaire.

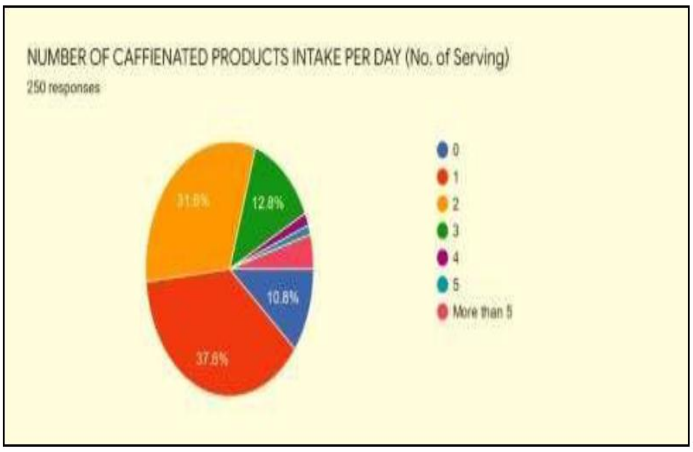

Fig. 5.9:- No. of servings.

This data is very crucial for the research studies result interpretation because the amount of caffeine consumed can only be detected on the basis of number of servings consumedby a participant in a day.

Physical exercise

The data of physical exercise or workout frequency of the participants was recorded. This data will help indirectly in the interpretation of results because it was estimated based on the previous studies THAT most of the youngsters consume caffeine products for enhancing their performance while working out so it can also be considered a factor for caffeine consumption.

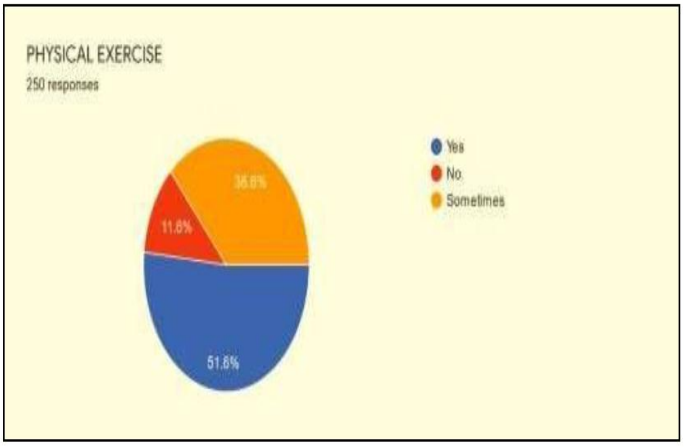

Fig. 5.10:- Physical exercise performed by participants.

Factors affecting caffeine intake

In the survey questionnaire 10 factors were mentioned which can lead to caffeine consumption. This factors have a strong connection with the desire to caffeine consumption

however these factors directly do not influence an individual but indirectly these factors play a key role in the caffeine intake.

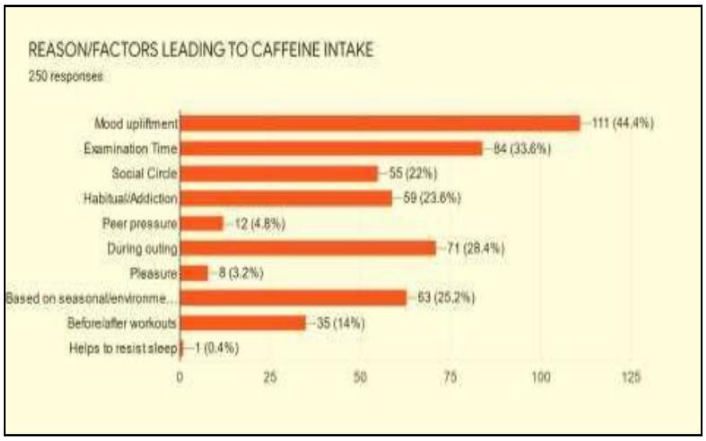

Fig. 5.11:- Factors affecting caffeine intake.

By interpretation of result it was found that mood upliftment was the major factor among the college students which leads to intake of caffeine. Around 44.4% participants mentioned mood upliftment as a reason for intake of caffeine, this suggests that consumption of caffeine can be associated with mood changes of an individual which indirectly means that it has certain effects on mental health among college students.

The second most common factor was consumption during examination time, it is natural because college student consume more caffeine in examination time for better concentration and to resist sleep.

Outing and seasonal changes factors also play a key role in consumption of caffeine, followed by habitual action, social circle, before & after workouts, peer pressure and at the end for a sense of pleasure.

Effects observed after caffeine intake

Physical effect observed after caffeine intake

In the survey questionnaire 7 parameters were mentioned to analyze the physical effect after caffeine consumption. The provided 7 parameters are correlated with the physical effects that are due to activity of the caffeine in the body.

After consumption of caffeine it will have 3 possible effects on physical parameters that are either the effects will increase, decrease or will have no effect on the physical parameters.[8]

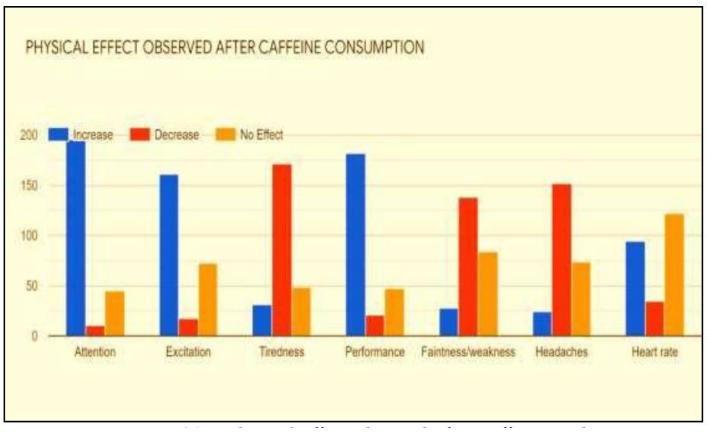

Fig. 5.12(a):- Physical effect observed after caffeine intake.

By result interpretation we found that around 150-200 participants experienced an increase in their attention, excitation and performance, whereas 94 participants experienced an increase in heart rate.

Around 140-170 participants experienced decrease in their tiredness, faintness and weakness, this signifies that caffeine has a vital role in governing the physical effects inhuman body. [(9)]

Mental effects observed after caffeine intake

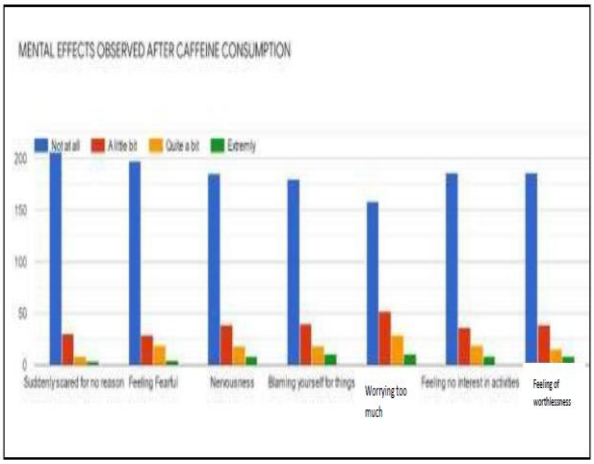

Fig. 5.12(b):- Mental effect observed after caffeine intake.

Based on the previous research studies and on analyzing the mental effects by any foreign element in the body some parameters are given which can be used forchecking the prevalence of any disease or disorder related to it. Hopkins symptoms checklist which consist of 25 parameters can be used for this purpose, out of this 25 parameters we took the main 7 parameters which are mainly triggered by the consumption of caffeine.[10]

These symptoms are also associated with the prevalence of anxiety disorders, the mental

effects observed are analyzed based on the factors driven by the amount of caffeine intake.

Four options were given for each effects observed that were 'Not at all'; 'A little bit'; 'Quite a bit'; 'Extremely'. Maximum responses were obtained for 'Not at all' for all parameters by the participants and the least response were observed for 'Extremely' for all parameters.

These data collectively shows that maximum participants does not witness any mental effect triggered by the caffeine consumption, so we can assume that there is less consumption of caffeine by the students due to which the psychological factors does not gettriggered.[11-12]

RESULTS

- Descriptive socio-demographic and anthropometric characteristics of the study participants are presented in Table 1. The majority of the participants were male (approx. 64.8%), the mean age was 22 ± 1.5 and the mean weight was 64.73 ± 6.53.

Table 6.1:- Sociodemographic characteristics.

Variable	Participants (n= 250)
Sex	
Male	162 (64.8%)
Female	88 (35.2%)
Marital status	
Unmarried	239 (95.25%)
Married	11 (4.8%)
Smoking	
Yes	20 (8%)
No occassionally	201 (80.4%)
Alcohol consumption	29 (11.6%)
Yes	27 (10.8%)
No	177 (70.8%)
Occassionally	46 (18.4%)
Residence	
Hostel	99 (39.6%)
Home	91 (36.4%)
Paying guest	13 (5.2%)
Personal room	47 (18.8%)
Physical exercise	
Yes	129 (51.6%)
No	29 (11.6%)
Sometimes	92 (36.8%)

Amount of caffeine present in different products is presented in Table 2, this data provides information about the serving size (in ml) and amount of caffeine present in it according to

thestandard serving size.[13-14]

Table 6.2: Amount of caffeine present per serving.

Product	**Weight** (In ml/grams)	**Caffeine conc.** (milligrams)
Coffee	236 ml (Cup)	163 mg
Tea	236 ml (Cup)	47 mg
Coke	354 ml (Can)	46 mg
Energy drink	355 ml (Can)	114 mg
Chocolates	44 gm (Bar)	110 mg
Green tea	236 ml (Cup)	25 mg

The daily intake frequency of caffeine of the study participants is presented in Table 3. The vast majority (approx. 90%) of the participants reported regular daily intake of caffeine products.

Approximately 70.42% of the participants consumed at least one cup of regular coffee per day, 65.6% consumed at least one cup of tea per day, 12% consumed at least one cup of green tea per day, 34% consumed at least one serving of coke per day, 30.8% consumed at least one can of energy drink per day, 129 % consumed at least one bar of chocolates per day.

Table 6.3:- Daily intake frequency of caffeine.

Variables(N=250) Intake Frequency of tea	**Participants**
1 Unit	56 (22.4%)
2 Unit	64 (25.6%)
3 Unit	25 (10%)
4 Unit	02 (0.8%)
5 Unit	10 (4%)
None	93 (37.2%)

Intake frequency of coffee

1 Unit	72 (28.8%)
2 Unit	54 (21.6%)
3 Unit	21 (8.4%)
4 Unit	04 (1.6%)
5 Unit	10 (4%)
None	89 (35.6%)

Intake frequency of green tea

1 Unit	11 (4.4%)
2 Unit	09 (3.6%)
3 Unit	05 (5%)

4 Unit	01 (0.4%)
5 Unit	02 (0.8%)
None	222 (88.8%)

Intake frequency of chocolates

1 Unit	46 (18.4%)
2 Unit	37 (14.8%)
3 Unit	17 (6.8%)
4 Unit	02 (0.8%)
5 Unit	09 (3.6%)
None	139 (55.6%)

Intake frequency of energy drink

1 Unit	33 (13.2%)
2 Unit	14 (5.6%)
3 Unit	10 (4%)
4 Unit	03 (1.2%)
5 Unit	09 (3.6%)
None	181 (72.4%)

Intake frequency of coke

1 Unit	33 (13.2%)
2 Unit	25 (10%)
3 Unit	13 (5.2%)
4 Unit	02 (0.8%)
5 Unit	06 (2.4%)
NONE	171 (68.4%)

The mean daily caffeine intake data is represented in Table 4, it was estimated to be 108 mg/dayfrom all sources. The main sources of caffeine: coffee, tea, chocolates and coke with 163 mg/day, 47 mg/day, 110 mg/day, and 46 mg/day were obtained from these products per person; respectively. Mean caffeine intake from all sources was higher for males than for females. There were no statistically significant differences between males and females in the amount of caffeine consumed from green tea, energy drinks and coke. Males consumed more caffeine from coffee and tea compared to females. Females consumed more caffeine from chocolates compared to males.[15]

Mean daily intake of caffeine by source

Table 6.4:- Mean daily intake of caffeine by source.

Coffee	150.13 ± 13.87
Tea	30.25 ± 16.75
Chocolates	80.40 ±29.60

Energy drink	90.20 ± 69.80
Green tea	10.50 ± 14.50
Coke	30.55 ± 16.40

[Units are standard cup (8 fluid ounces) = 236 ml, Energy drink can (12 fluid ounces) =355 ml, Chocolate bar = 44 gm, Coke can (12 fluid ounces) = 355 ml]

Given below Table 5, represents information about the prevalence of caffeine intake value in the study participants. The safe concentration of caffeine is estimated to be 400 mg/day by USFDA. In the collected survey data we found that our study population consumes caffeine inthe safe range that is less than 400 mg/day.

About 37.2% participants consumed up to 100 mg/day, 31.2% participants consumed caffeine in the range of 100-200 mg/day, 12.4% participants consumed caffeine in the range of 200-300 mg/day, and only 6.8% participants consumed more than 300 mg/day and less than 400 mg/day, while 10.8% participants reported zero intake of caffeine.

Prevalance of caffeine value

Table 6.5:- Prevalence of caffeine intake value.

Caffeine = 0 mg /day	27(10.8%)
Caffeine >0<100 mg /day	93(37.2%)
Caffeine> 100mg/day	78(31.2%)
Caffeine > 200 mg / day	31(12.4%)
Caffeine >300mg/day	17(6.8%)

DISCUSSION

The present study aimed to study physical and mental effects observed after caffeineintake by university students using data from a convenience sample of over 250 students from different colleges in India. The study is based on a detailed survey that examined thefrequency and quantity of intake of an extensive range of commonly available caffeinatedproducts. The study also used the HSCL-7 to examine the association between high caffeineintake and mental health.

About 89.2% of students reported regular daily intake of caffeine, with the majority consuming coffee, tea, and soft drinks. The total mean caffeine intake was 108 mg/day.

Our results are lower than the published estimates of the intake of caffeine by U.S., Dutch and Bahrain university students, who consume an average of 159 mg/day, 268 mg/day and

144 mg/day, respectively. One possible explanation for the lower intake of caffeine in our study population is the fact that caffeinated beverages are not so popular among university students and young adults in India also this caffeinated beverages are consumed by the studying population in influence by environmental factors and mainly for mood upliftmentand during examination time.

This proposition is supported by the findings of caffeine intake among university students in a neighboring country, the United Arab Emirates (UAE), where caffeine intake was estimated to be approximately 250 mg/day. In the Arab region, caffeinated beverages, especially tea and coffee, are an essential part of hospitability in every social event, thus, their intake is influenced by social norms.

Similar to U.S., Dutch, Bahraini and UAE students, Indians students surveyed consumed most of their caffeine from coffee and tea. The daily intake of caffeine from energy drinksin Indian students was similar to results from the U.S.

Consistent with previous research, our study suggests that caffeinated beverages make the largest contribution to the total caffeine intake per day amongst all the examined sources of caffeine.

The overall mean intake of caffeine from all dietary and non-dietary sources by university students was within levels considered to be acceptable by many dietary recommendations. The safe concentration for caffeine intake is considered to be 400 mg/day, in this study we found that the maximum intake was between 300-400 mg/day which lies in the safe concentration. Levels of unsafe or maximum caffeine intake remain debatable, due to limited safety data.

Our research shows that caffeine consumption in the safe range does not have any impact on the mental parameters that were mentioned in the survey, this statement is proved by the responses obtained from the study participants. In the survey questionnaire maximum responses were obtained for the option ‘Not at all” against the 7 mental parameters thus it proves that low caffeine intake does not trigger these symptoms.

Caffeine consumption in the safe range affects various physical factors like we foundin the survey population that consumption of approximately 150-200 mg/day of caffeine can increase attention, excitation also it is effective in decreasing weakness and has a subsequent

effect in decreasing headaches. An increase in the performanceability of the participants was also observed after caffeine consumption.

Because this is an observational study, we cannot demonstrate a causal link between caffeine intake and present pointed out anxiety-related symptoms reported by students in this study. The pharmacology of caffeine and related methylxanthines is complex, as they modulate a variety of biological targets. Nevertheless, clinical and experimental investigations of caffeine pharmacology provide biological plausibility to some of these effects, as outlined in a recent comprehensive review.

At physiologically relevant concentrations, the predominant pharmacological effect is as a purinoceptor antagonist. Caffeine acts at a number of adenosine receptors, including A1 and A2A. The A1A predominates in the brain, and the activation of A1A has been associated with anxiolytic effects. Indeed, positive allosteric modulators of A1A have been proposed as a therapeutic strategy for anxiety. Based upon laboratory observations, it is often claimed that caffeine is a phosphodiesterase inhibitor, however, this action is unlikely to occur, at any but the very highest concentrations in vivo, and the relevance to anxiety isunclear.

A recent comprehensive systematic review of the possible adverse effects of caffeine on the cardiovascular system, bone status, reproductive health, and development, as well as behavior, concluded that, for adults there was no evidence that a caffeine intake of up to 400 mg/day posed any risk of adverse effects.

The strengths of this study are numerous. Caffeine intake among university students was quantified by consideration of many possible sources, rather than only from caffeinated beverages. The examination of the association between caffeine intake and a list of common mental and physical symptoms related to health is a contribution to the literature.

There are several limitations to this study. The major limitation is that the obtained data were self-reported and various types of biases, e.g., recall bias, are becoming a challenge. The study is based on a self-selecting convenience sample that is unlikely to be representative of the entire university student population in India.

Because this is an observational study, rather than a randomized trial, we can only study associations between variables; we cannot demonstrate causality. Although we adjusted the odds ratios in our logistic regression model to account for demographic data, it is very likely

that residual confounding exists.[16]

CONCLUSION

Most of the study participants consumed caffeine in regular intervals from different sources, the most common source among all participants was coffee. The mean intake was 108 mg/day, with males consuming more caffeine than females. Our research population consumed caffeine in safe concentration so it does not cause any negative effects on the physical and mental health of study participants. Consumption of 100 mg/day caffeine or more than this resulted in the positive response on the physical factors, the study participantsreported no effects on mental health after caffeine consumption.

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