ORIGINAL ARTICLE

Coffee Consumption, its Impact and Psychotropic Effects among Young Adults

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ABSTRACT Coffee is one of the highest-selling and extensively consumed beverages globally due to its flavor, aroma, and stimulating effects on the central nervous system, such as cortisol reduction, improved energy, and mental alertness, among other things. India produces 3.14% of the world's Coffee. Coffee is a complicated chemical mixture that contains high levels of chlorogenic acid and caffeine, and it is frequently classified as a stimulant. As a result of worldwide lockdown due to the coronavirus pandemic and various causes, the adults appear to have increased their coffee consumption to keep up with the long hours. This study was conducted to have a deeper understanding of different factors influencing increased consumption. This study also provided an insight of how coffee affects adults and corroborated the rise in caffeine consumption. This research project's method was an online survey created with Google Forms. A close-ended questionnaire was used to conduct the online survey. The questions were posed in accordance with the project's goal of determining the level of coffee addiction among young adults and its impact and psychotropic effects prior to and during the pandemic. The data obtained were subjected to statistical analysis using the Chi-Square test and Z-test. The two variables, i.e., coffee and age depicted an augmenting relationship (P-value<0.05). During isolation, the data indicate that young working adults preferred coffee (P-value 0.05). These findings, among other results, revealed a considerable change in coffee consumption patterns prior to and throughout the lockdown period of the coronavirus pandemic.

Keywords: : Caffeine, Coffee consumption, Pandemic, Side effects, Chi-square test

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INTRODUCTION

Most of us blindly rely on a morning cup of coffee or a jolt of caffeine in the afternoon to help us get through the day. The decision to consume coffee is influenced by an individual's cultural sphere in which one resides and drinking coffee is as much a social activity as it is an act of consumption. Caffeine is present in a wide range of products like the obvious sources such as coffee, tea, soft drinks, and hot chocolate but also non-conventional sources like OTC medications for cold remedies, analgesics, and anorexiants[1].

India is the sixth-largest producer and fifth-largest exporter of the world whereas in Asia it is the third-largest producer and fifth-largest exporter of coffee[2]. Karnataka is the largest coffee-growing state producing 71% of Indian coffee[3]. By 2008, coffee consumption has seen a rise in India with urban populations consuming 73% of the total coffee and rural areas contributing to 27%[4].

Coffee is a complex chemical mixture and it contains many bioactive molecules like chlorogenic acids, polyphenols, methylxanthines. Caffeine, carbohydrates, potassium, magnesium, nicotinic acid are some of the main constituents of these bioactive molecules[5], [6]. Caffeine is the most used psychoactive drug in the world[7].

Coffee as a beverage is one of the most popularly consumed drinks worldwide. Most people habitually enjoy consuming coffee on a daily basis for unique features like its aroma, flavor[8], mental alertness, and social engagement. It entails

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several mixed factors, such as the pleasure, experience, lifestyle, and social status of a person. It can also provide an emotional pickup, both mentally and physically. It can be easily made, is abundantly available, and improves mood almost instantaneously by rewarding the active reward centers in our brain. Due to increasing anxiety, societal pressure on the youth, peer pressure, and mental health problems coffee provides a good substitute over other drinks being non-alcoholic and thus comparatively having much lesser detrimental effects on our body as a whole. It can be easily made, is abundantly available, and improves mood almost instantaneously by rewarding the active reward centers in our brain. Research conducted has proved that the dopamine (which is a major pleasure neurotransmitter) level of the participants increased significantly after ingestion of coffee[4].

The World Health Organization and many health experts recognize coffee dependency as a clinical disorder[9]. According to the definition given in the Statistical Manual of Mental Disorders, caffeine dependency disorder is defined as a cluster of behavioral, cognitive, and physiological phenomena that develop after repeated substance use and which typically include a strong desire to take the drug, and have difficulties in controlling the usage[10].

The virus outbreak that occurred in 2019, has played a massive factor in the increased consumption of coffee in recent months. After the announcement of the Covid 19 outbreak as a pandemic on 11th March 2020 and the implementation of lockdown in India by 23rd March 2020, there has been a trend observed in coffee consumption. Increased attention towards warm, comfort foods was seen all across the world to balance anxiety, depression, and homesickness. Even though cafes like Starbucks, Cafe Coffee Day were closed and there was a decrease in coffee consumption at workplaces [11], a new and emerging increase was seen in home coffee consumption due to the changing norms and acceptance of work from home (WFH) culture[12].

From the research conducted through this online survey, we intend to better understand the different factors influencing people to consume coffee, understand the reasons and rationale behind coffee addiction or rather a dependence, To find out the caffeine intake of young adults, pre-and on-going social isolation times, To figure out whether the consumers know about their caffeine intake and its effects on them, To understand and know whether the consumers know about the withdrawal effect of Coffee and the behavioral changes occurred in them (if any).

METHODOLOGY

An online survey was conducted to understand the dependency on Coffee and how its overconsumption leads to detrimental health effects. The survey was made open to all age groups, but our targeted age group was 15-30 years, and it was circulated online.

An online survey method was chosen for this research project considering the virus outbreak and pandemic. The questionnaire for the survey was designed to be short and easy to fill out.

Google forms were chosen as a format to prepare questionnaires for the survey. It was chosen for creating the survey because of the following reasons:

- It is a free tool that allows faster and more efficient data collection.

- The interface is user-friendly and easier to understand for the participants.

- It allows the participants to effectively answer questions of different types like multiple-choice, single choice, scale type, check-box type, and give the liberty to type answers wherever required.

- The data collected from the survey is easy to understand and analyze.

- The survey can be circulated on various platforms like WhatsApp, Telegram, and other social media platforms.

The questions added in the survey were selected on a few criteria:

- The importance of the questions.

- The relatability to the questions asked.

- The familiarity with the terms used in the questions.

- The participant's knowledge of the subject and time consumed answering each question.

The survey included four main categories of questions; we had included a few light-hearted questions (about recent quarantine trends) to maintain the participants' interest and make the survey more fun and relatable.

1) **Questions on Personal choice and general details:**

   These questions consist of personal and active choices made by consumers regarding caffeine and coffee intake.

   E.g., age, gender, Email-IDs, type of caffeinated beverage consumed, type of Coffee preferred, and a few questions on reasons for coffee consumption.

2) **Questions on Dependency on Coffee and triggers:**

   These questions aim to find out the dependency of youth on the beverage and factors reinforcing the dependency.

   E.g., closed-ended questions (Likert scale) to evaluate the dependency, factors triggering the beverage consumption,

the consumption time scale, and the comparison between pre-covid and current consumption.

3) Questions on the side effect of coffee on the body:

These questions are aimed to find out the common side effects correlated with consumption habits.

E.g., Effect on mood, general side effects, and duration spent without Coffee.

4) Questions to test knowledge of the participants on the subject:

The questions assessed general knowledge and awareness about Coffee and its different types.

E.g., Coffee withdrawal symptoms, amount of caffeine in certain beverages, decaffeinated Coffee, and quitting habits for those addicted.

The data obtained through the survey was collected and processed. Cleaning up of the data was done in Excel.

Excel was used for the statistical analysis. Excel acts as a powerful tool in analyzing large amounts of data. It is powerful sorting, filtering, and search options that narrow down the criteria, which helps us in our decisions. The Chi-square test, a non-parametric test, used a contingency table for the categorical data. This test is also referred to as "Goodness of Fit" since it helps us estimate the closeness of an observed distribution to an expected distribution in a population. The Chi-square test also helped us check the dependency of two variables in the same population. Z-test was used for the numerical data. In all the evaluations done using statistical tests, the level of significance was taken as 0.05%.

RESULTS

The survey was distributed to all age groups and different demographics. Confidentiality was maintained, and only necessary personal details like age, gender, and E-mail IDs were asked. A total of 378 participants responded to the survey.

Table 1: Questions on Personal Choice and General Details		
Questions	**Description**	**Percentage**
Gender	Female	58.70%
	Male	40.50%
	Others	0.80%
Age	Below 30	85.30%
	Above 30	14.70%
Types of Caffeinated Beverage consumed	Coffee	69.80%
	Non-Coffee	30.20%
Types of Coffee consumed	High milk content	21.70%
	Medium milk content	53.40%
	Low milk content	10.80%
	Black Coffee	14%
Does having Coffee make one feel refreshed/better?	Yes	92.60%
	No	7.40%
Does Coffee boost productivity?	Yes	92.60%
	No	7.40%
Purpose of consumption of Coffee:	Feel awake and stay up late	42.60%
	Focus and concentration	31%
	Alert and productive	27%
	Physical performance	15.10%
	No reason	39.70%

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Table 2: Questions on Dependency on Coffee and Triggers		
Questions	Description	Percentage
Dependency on Coffee	1/5	34.10%
	2/5	23%
	3/5	24.30%
	4/5	9.80%
	5/5	8.70%
Coffee cravings	Yes	47.10%
	No cravings	52.90%
Triggers that lead to coffee consumption	Smell of Coffee	63.80%
	Commercial advertisement	9%
	Seeing others drink Coffee	5%
	Others	22.20%
Since when Individuals are consuming coffee	Recently	5.60%
	A few months ago	20.40%
	A few years ago	15.30%
	Ages ago	15.10%
Did coffee consumption increase after lockdown?	Yes	13.20%
	No	81.50%
	Maybe	5.30%

STATISTICAL ANALYSIS

The analysis was done from the responses we got from the survey conducted. The results have been analyzed and calculated using the Chi-Square Test and Z-Test with the help of the 16.52 version of Excel. The significance (alpha) value was kept at 0.05.

With reference to Table 1, there was no significant association between the variables of age and coffee consumption (P-value>0.05). However, a significant association was observed between an increase in productivity after coffee consumption and its intake. Many people believe that there is a boost in productivity after consuming coffee. So, we interpret that Coffee is a preferable beverage across the age. A significant association was seen in the young population as they preferred more Coffee during isolation. While comparing age with the purpose of coffee consumption in isolation, a significant relationship was observed. (P-value < 0.05).

Considering the degree of dependency and coffee consumption shown in Table 2, a strong correlation was found between the two variables (P-value<0.05). A significant relationship was observed between the age group of 15-30 years and increased coffee consumption in lockdown.

In context with Table 3, a significant difference was observed in coffee consumption and among a range of side effects. There were mood changes observed concerning the degree of dependency on Coffee (P-value<0.05). The mood changes like nausea, headache, irritability, annoyance, insomnia, anxiety, muscle stiffness.

Attributing to Table 4, a close association was noticed between reluctance to quit Coffee and its consumption. There was a lack of awareness seen among people regarding the amount of coffee in a shot of espresso, and it was confirmed by performing the T-test.

DISCUSSION

Coffee is a beverage that is firmly embedded in our daily lifestyle[13]. This research study done with the help of an online survey provides research-related and statistical information. The data provides information and evidence on coffee consumption, how it affects an individual's mood, the side effects experienced by the people consuming coffee, and what

Table 3: Questions on the Side Effect of Coffee on the Body		
Questions	**Description**	**Percentage**
Mood Changes are experienced when coffee is not consumed	Nausea	5.60%
	Headache	20.40%
	Irritability	15.30%
	Annoyance	15.10%
	Insomnia	16.90%
	Anxiety	6.10%
	Muscle Stiffness	7.90%
	None	58.20%
Side effects experienced after consuming Coffee	Sleep disorder	20.90%
	Nervousness	8.50%
	Cardiovascular problems	2.60%
	Acid reflux	19%
	Stomach aches	7.70%
	Kidney and liver problems	2.40%
	None	61.60%
The time that has been spent without consuming Coffee by individuals	Less than 24 hours	15.10%
	More than a day	14%
	More than a few days	12.40%
	More than a week	58.50%
After coffee addiction, are withdrawal symptoms seen?	Yes	88.90%
	No	11.10%

drives or triggers them to have coffee. There was a distinct difference in the coffee consumption pattern of respondents pre and during the social isolation. This is probably because coffee has always been an integral part of people's routines. They have become more habitual coffee drinkers during isolation, probably due to work from home, excessive work/ study hours, binge-watching, and numerous other factors. Evidence concerning actual amounts of caffeine intake in this population is mainly lacking because caffeine intake is often neither regulated nor monitored. We observed that the individuals below 30 years preferred coffee as their choice of caffeinated beverage compared to those aged above 30 years and claim that it boosts productivity, makes them feel refreshed, and helps them stay up late for the long working hours amid pandemic. Where dependency on coffee, triggers that lead to its consumption, and how it affects the mood were considered, the respondents agreed that their coffee

consumption has increased after lockdown and the coffee cravings and their mood is highly affected. The primary trigger was the smell, and the least triggering factor was seeing others drink coffee. The majority of coffee drinkers do not show any side effects, while some show a few. Thus, we can conclude by saying that most coffee consumers from the youth under study showed no side effects after consuming this caffeinated beverage.

Awareness about the amount of caffeine consumed is critical to prevent dependency or addiction and boost productivity. Overconsumption can lead to many side effects on the body like headache, irritability, annoyance, nauseousness, sleep disorders[14], acidity, nervousness, depression[15], acid reflux[16], and cardiovascular problems[17]. Although many studies have suggested that the fears of increased disease associated with coffee consumption may be justified, many questions about the health effects of

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Table 4: Questions to Test the Knowledge of the Participants on the Subject		
Questions	Description	Percentage
Amount of caffeine present in Espresso?	30 mg	33.90%
Answer: 63 mg	63 mg	42.10%
	92 mg	12.70%
	125 mg	11.40%
Does instant coffee has more caffeine than regular Coffee?	Yes	76.50%
Answer: No	No	23.50%
Ever tried quitting or lessening Coffee?	Yes	21.50%
	No	74.90%
How many Cups of coffee amount to overconsumption?	Less than 5 cups	82%
Answer: Approximately more than 6 cups (400 mg of caffeine) is considered overconsumption.	More than 5 cups	18%
Is decaffeinated coffee better than regular brewed coffee?	Yes	32.80%
Answer: Yes, decaf is the same as regular Coffee but without any side effects.	No	26.20%
	Maybe	41%

coffee and caffeine use remain unanswered[18]. The difference between types of coffee must be known, and consumption must be based on personal tolerance levels. The ideal amount of caffeine present in a shot of espresso is 63 mg[19]. The amount of caffeine consumed must be lowered if it affects day-to-day activities. By understanding the functional needs, emotions, and side effects, the Coffee Industry can reorient to promote innovative coffee products, possibly spread awareness and righteous information about coffee consumption and create an image that fits with healthy behavior[8]. Silent sources of caffeine like chocolate, energy drinks, and soft drinks must also be considered to understand the impact of caffeine on the body. Awareness programs must be conducted informing the consumers of the advantages and the disadvantages of caffeine consumption, types of coffee, and other caffeinated products.

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