

The Effect of Coffee Consumption on Blood Pressure and Sleep Duration of Baristas in Majalengka

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ABSTRACTS

Drinking coffee is one of the most popular and loved by the community. The practice of drinking coffee has been associated with many health issues, both positive and negative. In association with their profession, baristas could consume more coffee, which is believed to affect their health. The objective of this study was to study the correlation between coffee consumption and baristas' blood pressure and sleep duration in Majalengka Regency. A cross-sectional design was used in this research. There were 40 baristas' in Majalengka involved in this experiment. A questionnaire and a sphygmomanometer were employed as instruments, and Spearman's instrument was used to examine the data. Respondents drank an average of 4 cups of coffee per day, had a systolic blood pressure of 117 mmHg, a diastolic of 77.75 mmHg. Sleep duration was negatively correlated with coffee consumption ($p=0.012$; $c=-0.395$). This study revealed that coffee consumption was not correlated with blood pressure ($p=0.168$). Coffee consumption has a negative relationship with sleep duration, which is controlled by the blood pressure variable, and it also does not influence blood pressure. In this study, we found the necessity of promoting healthy eating habits for baristas and cafe owners in the Majalengka Regency.

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1. Introduction

Drinking coffee has become activities that enjoyed by almost everyone, particularly youngsters and adults. Consumption of coffee has health benefits for those who regularly. Polyphenols and potassium in coffee can reduce high blood pressure and help to maintain blood sugar levels. On the other hand, the caffeine from coffee may interfere with the activity of adenosine and promotes vasoconstriction in the blood vessel, causing blood pressure to increase.¹

Over 80% of the world's population gets caffeine daily, either as a stimulant, component of drugs, or commonly used to ease jet lag when traveling (Sadock, 2007). Caffeine can be found in a variety of products, including coffee, energy drinks, cocoa, and soft drinks. According to the National Coffee Association of the United States, daily coffee consumption increased from 13% to 36% among adolescents aged 18-24 years in 2016. ² The influence of lifestyle and the expansion of restaurants and coffee shops have significant support in the growth of coffee consumers.

According to the findings of the 2013 Basic Health Research (Riskesdas) survey, 29.3 percent of Indonesians consume coffee daily. Bali (49.0%), East Nusa Tenggara (47.6%), and West Kalimantan (47.6%) had the highest consumption levels (45.8%). In general, 1 cup (200 ml) of coffee contains 100 grams of caffeine meanwhile, 1 large cup (450 ml) contains 225 grams of caffeine.³

Majalengka Regency is a region in West Java that is well-known for its coffee production. Coffee is Majalengka's fourth dominant crop commodity. Majalengka produced 1029.88 tons of coffee beans in 2017 and 1138.26 tons in 2018. According to Riskesdas, the percentage of coffee drinkers who consume more than one cup per day in Majalengka was 28.3% in 2013. Coffee consumption between 1-6 times per week is 23.3%, whereas those who consume less than three times per month are 48.4%.³ The passion for drinking coffee in cafes in Majalengka has increased significantly, as seen by the growth of coffee shops from 40 in early 2019 to 74 in 2020.

Coffee consumption is associated with a variety of health problems, either beneficial or detrimental. Caffeine consumption in low amounts is beneficial. Caffeine was known to affect performance or mental state by reducing or eliminating sleep.^{5,6} Coffee's polyphenol and potassium can decrease blood pressure. Polyphenols reduce atherogenesis and enhance vascular function, while potassium decreases systolic blood pressure by decreasing renin release, increasing salt and water secretion.⁷ The chlorogenic acid in coffee is also known for its ability to suppress gluconeogenesis by delaying glucose absorption.⁸ According to Pradana and Wulandari (2018), there was a statistically significant difference in blood sugar levels between individuals with type 2 diabetes mellitus that had coffee and those who did not get coffee.⁹

Coffee consumption and blood pressure could have a positive or negative relationship. Caffeine in coffee can raise blood pressure, while potassium and polyphenol are shown to reduce blood pressure. Rahmawati and Daniyati (2016) discovered a correlation between coffee drinking habits and hypertension levels. There is a very strong association between coffee drinking habits and hypertension levels (correlation coefficient of $r = 0.809$).¹⁰ Taken one cup of coffee daily (100 mg caffeine) may significantly impair sleep quality, lengthen sleep latency, and increase awakening frequency. According to Kadita's (2017) study, coffee consumption and screen time at night are associated with sleep length.¹¹

A barista is a coffee specialist who has extensive training and expertise in brewing coffee

and other espresso-based drinks. Baristas are expected to have a comprehensive knowledge of coffee, from the process of cultivation to the storage, drying, roasting, grinding, packaging, extraction time, water temperature and quality, micro milk frothing, coffee machine operation, and latte art (disposal & recycling).¹² Baristas who are actively engaged in their profession can consume more coffee in varied serving sizes, which is considered to affect their health. Search results on Google Scholar show that there is no study on the effect of coffee on the health of baristas. The purpose of this research is to determine the impact of coffee consumption on the blood pressure and sleep duration of baristas.

2. Materials and Methods

This quantitative study used an analytical observational design and a cross-sectional approach, analyzing both the independent and dependent variables over a period. In this research, the independent variable was the barista's coffee consumption level in Majalengka Regency, whereas the dependent variables were the barista's blood pressure and sleep duration.

The research population comprised entirely of registered baristas in Majalengka Regency. There are currently 40 baristas registered as community members, and all of them were used as samples and subjects for this research (total sampling).

The instruments used in this study were a questionnaire and a sphygmomanometer. The questionnaire contains the respondent's data, the frequency, the volume of drinking coffee, and the duration of sleep. The sphygmomanometer is used to measure the blood pressure (systolic and diastolic) of respondents. The data were analyzed using the Spearman rank test.

3. Results and Discussion

The characteristics of the respondents in this study are described in table 1 as follows:

Table 1. Respondent Characteristic

Variable	Number	Percentage
Age, mean \pm SD		23,9 \pm 2,59
Working experience (year) \pm SD		2,75 \pm 1,43
Sex		
- Male	38	95
- Female	2	5
Education		
- Senior High School	14	35
- Vocational High School	24	60
- Bachelor	2	5
Coffee consumption		
- 1-3 cups per day	12	30
- > 3 cups per day	28	70

The main characteristics of the respondents (baristas) in this study were male (95%) with an average age of 23.9 years and work experience of 2.75 years. Most of them are high school graduates (Vocational High School as much as 60% and Senior High School as much as 35%). Most of the respondents drank more than 3 cups of coffee per day (67.5%) and had a habit of snacking (67.5%). Their snacking activities are mostly conducted during the night or while

they are having their screen time.

Table 2. Analysis of Univariate Variable

Variable	Minimum	Maximum	Average	SD
Coffee consumption	2	8	4,1	1,32
Systole	100	135	117,3	8,04
Diastole	70	90	77,75	7,8
Sleep duration	6	14	8,74	2,26
Screen time	2	18	8,10	4,61

Respondents drank an average of 4 cups of coffee per day. They have blood pressure with an average value of 117 mmHg systolic and 77.75 mmHg diastolic. Respondents also had sufficient sleep time, namely 8.74 hours on average, despite having a relatively long screen time of 8.1 hours.

Table 3. The Analysis of Coffee Consumption on Baristas' Blood Pressure and Sleep Duration

Variable	Drinking coffee frequency		Total	p-value	Correlation coefficient	OR
	Normal	High				
Blood pressure						
- Normal	11 (91,7)	20 (71,4)	31 (77,5)	0,168	0,222	4,4
- Hypertension	1 (8,3)	8 (28,6)	9 (22,5)			
Sleep duration						
- Adequate	3 (25)	19 (67,9)	22 (55)	0,012	- 0,395	0,16
- Lack	9 (75)	9 (32,1)	18 (45)			

The results of the bivariate analysis using the Spearman Rank correlation test showed that there was only one related variable, namely the duration of sleep with a p-value = 0.012) and an OR value of 0.16. Thus, it can be said that people who consume coffee are 0.16 at risk for normal sleep. There is a negative relationship between the frequency of drinking coffee and the length of sleep, so it can be concluded that the higher the frequency of drinking coffee, the shorter the sleep time.

The results of this study also showed that the average coffee consumption was 4 cups per day with a minimum frequency of 2 cups and a maximum of 8 cups per day. As many as 28 baristas (70%) consumed coffee more than 3 cups per day. This result is different from the research conducted by Ratnasari, et al (2015) which stated that as many as 46% of men aged 35-50 years at the Teruwai Health Center in Central Lombok consumed coffee in the frequent category (3-4 times/day).¹³

Research by Ratnasari, et al (2015) tries to explore more deeply the reasons for respondents who consume more than 5 cups a day. It is known that coffee is always provided at work and has become an everyday drink. Another reason is that respondents will experience headaches if they do not drink coffee.¹³ People who usually drink coffee or tea will suffer from headaches in the morning, or after 12-16 hours from the time they last consumed them.¹⁴

A similar situation was also expressed by baristas who consume coffee to boost their concentrate at work. Barista needs to focus during their work, especially when they need

to calibrate the coffee appropriately. Excessive coffee consumption is thought to have a detrimental impact on a person's health status. Coffee consumption 2-3 cups/day (200-250 mg caffeine) able to increase systolic blood pressure 3-14 mmHg and diastolic pressure 4-13 mmHg.¹⁵ Although the individual had a normal blood pressure level before drinking coffee, caffeine might rapidly increase the blood pressure.

The results of the analysis showed that coffee consumption was not correlated with blood pressure, since it had a significance value of 0.168 ($p > 0.05$). Most of the baristas who consume coffee three times a day (91.7%) showed normal blood pressure. Meanwhile, those (28.6%) who drank more than 3 cups of coffee a day had high blood pressure.

Experimental research shows that the increase in blood pressure in people who frequently consume coffee is acute. Long-term coffee consumers, on the other hand, did not suffer an increase in blood pressure and showed tolerance for long-term coffee intake.¹⁶ Apart from the young age of the respondents, this can explain the absence of a correlation between coffee consumption and blood pressure baristas in Majalengka.

The sleep duration for baristas in Majalengka is in the range between 6-14 hours with an average of 8.74 hours. Categorization of sleep duration is done by setting a cut-off point of eight hours as the limit for adequate sleep. The results showed that as many as 22 baristas (55%) had adequate sleep duration, and the remaining 18 people (45%) was lacked off sleep duration. Caffeine consumption has been shown to cause poor sleep quality in terms of the number of hours of sleep, sleep onset, the satisfaction of sleep, and sleep depth. In addition, lack of sleep duration disrupts activities in the morning. This is an effect of the action of adenosine receptor antagonists that can affect the function of the central nervous system and can interfere with sleep quality.¹⁷

The results of the analysis show that the strength of the relationship between coffee consumption and blood pressure is -0.395 and can be categorized as moderate (0.25-0.50). Coffee consumption is also known to be negatively correlated with sleep duration, which is indicated by the value of $p = 0.012$ ($p < 0.05$). This means that the more coffee you drink, the less sleep you will have. The odd's ratio of the relationship is 0.16; this means that the more coffee consumed, the risk of getting adequate sleep is only 0.16 times. The low probability of sleeping adequately is due to the OR values less than 1.

According to the descriptive data, the results of data analysis showed that the average sleep duration was adequate (eight hours). However, the barista's bedtime is inconsistent, and they often sleep too late. A total of nine baristas (32.1%) baristas with high levels of coffee consumption had low sleep duration. The results of this study are in line with research conducted by Ammon.⁴ Coffee has been associated with short sleep time. Research shows that high caffeine consumption can make it difficult for a person to sleep. This is due to the caffeine content in coffee, which can increase alertness, improve work performance, and reduce drowsiness during short sleep durations.

One cup of coffee with a caffeine content of 100 mg and taken daily, can significantly impair sleep quality, prolong sleep latency, and increase the frequency of awakening. Research shows that taking 100 mg of caffeine three hours before bed and 100 mg of caffeine one hour before bed can increase sleep latency and reduce sleep efficiency.⁴

The study's limitation is that there is a lack of studies on baristas' health, making it difficult for researchers to explain variables related to coffee intake among them. Additionally, the research sample is still small, thus demanding subsequent research with a larger population and

sample size.

4. Conclusions

In Majalengka Regency, coffee intake was not associated with baristas' blood pressure, but rather with their sleep duration. Multiple health status markers, such as blood pressure and blood tests, such as glucose, fat, hemoglobin, LDL, and HDL levels, are important for the detection of metabolic and cardiovascular disorders. Additionally, shop owners must pay attention to their store's operating hours to avoid closing too late.

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