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The frequency of coffee consumption in the Slavic population and its impact on health

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Abstract

Introduction and purpose:

There are many articles specifying coffee's influence on the health and behavior of consumers. However, most of the studies are conducted on populations living in the United States, Western Europe or China. We did not find many studies reporting the effects of coffee consumption on the Slavic population. The aim of our study was to determine the frequency of coffee consumption in this population and its impact on such health elements as insomnia, body weight, well-being, irritation, hypertension or headache.

Material and method:

The anonymous survey included questions about the frequency of coffee consumption and selected health effects was created and subsequently distributed through social media (Telegram platform) in August 2023.

Results:

We collected a total of 89 surveys. The median age of participants was 31 (IQR: 24-38). 27 individuals indicated that they do not consume coffee at all (30.34%). The rest of the group most often choose the following options: I drink it several times a day - 24 individuals (26.97%) and 26 individuals drink it once a day (29.21%). We demonstrated a correlation between the amount of coffee consumption and the frequency of insomnia ($r=0.39$, $p=0.028$). Additionally, we observed a negative correlation between coffee consumption and body weight ($r=0.18$, $p=0.048$). However, we did not find a relationship between coffee consumption and elevated or lowered mood ($p>0.05$).

Conclusions:

In the study group, the frequency of coffee consumption was higher than the global average and in some cases led to insomnia. The positive aspects of drinking coffee outweighed the side effects and lead to the conclusion that it is a safe drink in the group of surveyed Slavs.

Key words: Coffee; Caffeine; Obesity; Sleep Initiation and Maintenance Disorders;

Introduction and purpose

Next to the water, coffee is the leader among beverages, its global market is valued at approximately USD 127 trillion and is gradually increasing from year to year. [1].

In Europe, the coffee industry is experiencing rapid growth. Notably, Germany, Italy, and Belgium present appealing prospects for exporters of green coffee. These nations exhibit a combination of favorable features, including substantial volumes directly sourced from coffee-producing countries and a burgeoning market for specialty coffee. European consumers are becoming more conscious of the origins of their food and beverages, expressing a preference for fair-trade or organic coffee [2].

Coffee contains numerous biologically active compounds and exerts significant influences on long-term human health. Recent research has delved into various health outcomes linked to coffee consumption. Large prospective studies consistently reveal a negative correlation between coffee intake and overall mortality[3], the lowest relative risk is at intakes of 3.5 cups a day. Regular consumption of coffee is also linked to reduced risks of cardiovascular death and various adverse cardiovascular events, such as coronary heart disease, congestive heart failure, and stroke [4,5]. Coffee seems to have neutral effects on arrhythmias and hypertension [6]. Additionally, habitual coffee consumption is associated with improvements in certain cardiovascular risk factors like type 2 diabetes, depression, and obesity [7].

Coffee contains polyphenols, compounds with antioxidant properties that capture free radicals and remove them from the body [8]. In this way, the cell destroying process is delayed and heart disease is prevented. Additionally, it improves the ability to focus and reduces the feeling of fatigue. Coffee also has a positive effect on the digestion process and accelerates the metabolic rate. One of the components of coffee that probably has the ability to lower glucose levels is Chlorogenic acid [9]. This substance has antioxidant and anti-inflammatory properties and may influence the metabolism of glucose and lipids. Due to these antioxidant, anti-inflammatory and metabolic properties, coffee and its chlorogenic acid components have a beneficial preventive and therapeutic effect on diabetes, cardiovascular diseases and cancer [10–12]

Coffee can be recommended to both healthy people and those with elevated levels of cholesterol and glucose in the blood, diabetes and hypertension [9,13]

Among the articles devoted to coffee, you can find many more assessing its impact on health and consumer behavior. However, most of the studies were conducted on populations living in the United States, Western Europe or China. We did not find many studies reporting the effects of coffee consumption on the slavic population.

The aim of our study was to determine the frequency of coffee consumption in this population and the impact of coffee and the substances it contains on such health elements as insomnia, body weight, well-being, irritation, hypertension, headache, as well as to compare the events to other similar studies.

The relationship between coffee and mental health

Due to its various forms of administration, caffeine is widely used as an energy boost source. Coffee, pills, soda and energy drinks are some of the most popular sources of caffeine. Some of the benefits attributed to moderate caffeine consumption includes; increased alertness and concentration, improved mood, and increased cognitive function. On the other hand caffeine consumption is associated with increased anxiety levels in adults suffering from generalized anxiety disorder [14]. Notwithstanding, people who consume caffeine typically experience greater beneficial effects on behavior, including increased alertness and energy boost [15]. Caffeine is the most commonly used stimulant affecting the central nervous system around the world, and coffee is the most popular source of this substance [16]. Primary reasons for consuming caffeine include improving physical performance, increasing energy, personal pleasure, improved concentration, reducing stress, and social purposes. [17].

Crucial for mental health is sustainable coffee consumption. Caffeine in moderate doses can bring positive effects such as improved alertness and mood. On the contrary, excessive caffeine consumption can lead to increased stress and anxiety levels. It depends on individual tolerance and how this drink is consumed. [18–20]. It is worth noting that the reaction to coffee is very individual. Some people may experience positive effects such as increased energy and motivation levels, while for others, excess caffeine can cause nervousness, irritability and sleep problems. Therefore, it is important to monitor your own reactions and adjust your coffee consumption to your needs. Caffeine consumption was not associated with difficulty falling asleep or other sleep problems, even after taking age, gender, and smoking into account [21].

The relationship between coffee and physical health

Coffee has a multifactorial effect on physical health, aspects of which can be both positive and negative. First of all, the caffeine contained in coffee may contribute to a short-term increase in energy level and improve physical performance by stimulating the nervous system. It also speeds up the metabolism, which may support the calorie burning process. Coffee consumption can reduce the amount of fat accumulating in the body by inhibiting the growth of fat cells [22], influencing transcription factors responsible for the production of lipids [23]and influencing the gastrointestinal microbiota [22].

On the other hand, excessive caffeine consumption may lead to health problems. Excessive coffee consumption can cause hyperactivity, anxiety and even heart rhythm disturbances. In addition, drinking coffee shortly before bedtime can disturb sleep and affect the quality of the body's regeneration. It is important that coffee may also affect the digestive system. Consuming large amounts of coffee may lead to excess hydrochloric acid in the stomach, which can exacerbate problems with stomach ulcers or acid reflux in some people.

Materials and methods

In order to assess the impact of coffee on mental and physical health, we created a survey assessing the discussed aspects. The survey consisted of a total of 9 questions. The questionnaire was created using Google Forms and was sent out via Telegram between August 20 and 26, 2023. 89 people completed the survey. All participants were familiarized with the rules of participation in the study, agreed to them and had the opportunity to resign from the participation at any time.

The questionnaire consisted of the following questions: age, how often do you drink coffee?, what is your current body weight?, how often do you eat?, how highly do you currently rate your mood?, how often have you felt irritated in the last month?, whether you are currently being treated for hypertension?, how often you have headaches? and how often insomnia occurred in the last six months?. All items except age were presented as questions that could be answered by selecting one option.

Statistical analysis

The data were analyzed using Excel and statistical calculations were performed using Statistica. To evaluate the normality of the distribution of continuous variables, the Shapiro-Wilk test was performed. Ordinal variables were presented by absolute number and corresponding percentage. The interdependence between factors was examined through correlation - the non-parametric rho-Spearman test was used. To compare two groups we used the U Mann-Whitney test. To compare binary data (presence/absence of diabetes depending on the presence of diabetes in the family) the Chi^2 test without using the continuity correction was performed. A p value below 0.05 was considered statistically significant.

Results

In total, we collected 89 surveys. The median age of participants was 31 (IQR: 24-38). The answers to the first two questions are included in Chart 1 and Chart 2. The remaining data are presented in Table 1. The percentage of answers in relation to the total number of surveys collected is presented in brackets next to the answers.

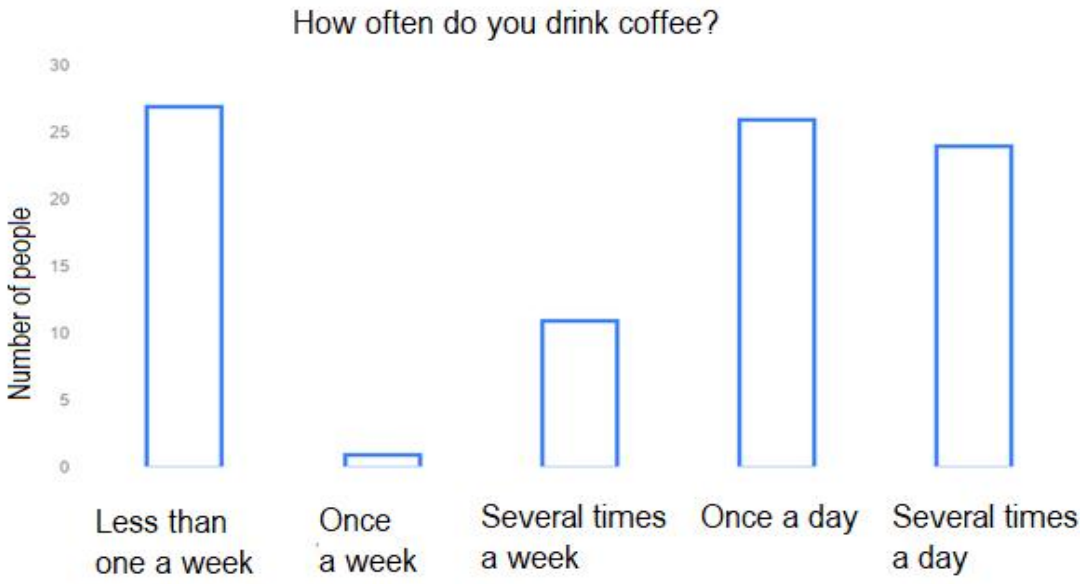

Chart 1.

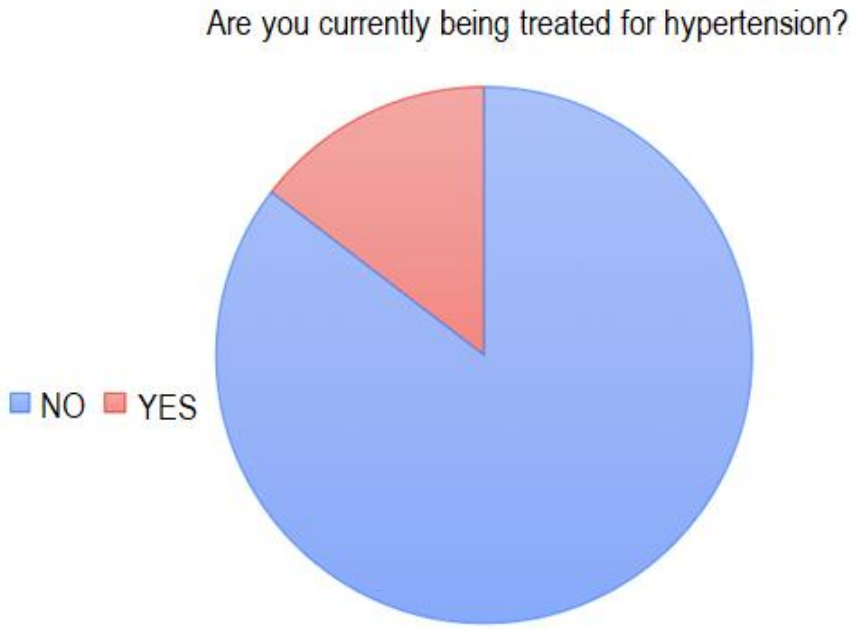

Chart 2.

Answer	Number of people [%]
How much do you currently weigh?	
Severe thinness	2 (2.25)
Underweight	8 (8.99)
Normal weight	47 (52.81)
Overweight	14 (15.73)
Obese	18 (20.22)

How often do you eat?	
Once a day	3 (3.37)
Twice a day	12 (13.48)
Three times a day	36 (40.45)
Four times a day	21 (23.60)
Five times a day or more	17 (19.10)
How highly do you rate your current mood?	
Very reduced	17 (19.10)
Slightly reduced	19 (21.35)
Neutral	50 (56.18)
Slightly elevated	0 (0)
Very elevated	3 (3.37)

How often have you felt irritated in the last month?	
Never	5 (5.62)
Rarely	15 (16.85)
Sometimes	46 (51.69)
Often	20 (22.47)
Everyday	3 (3.37)
Have you suffered from insomnia in the last 6 months?	
No	2 (2.25)
Several times	7 (7.87)
Once a month	56 (62.92)
Several times a month	21 (23.60)

Almost every day or every day	3 (3.37)
Do you get headaches often?	
Very rarely	4 (4.49)
Rarely	13 (14.61)
Once a month	37 (41.57)
Several times a month	34 (38.20)
Almost every day or every day	1 (1.12)

Table 1.

We found an association between the amount of coffee consumed and the occurrence of insomnia ($r=0.39$, $p=0.028$), as well as a negative association between the amount of coffee consumed and body weight ($r=0.18$, $p=0.048$). However, we did not notice a significant relationship between the amount of coffee drinking and mood ($p>0.05$).

Moreover, we did not demonstrate that coffee drinking was associated with the presence or absence of hypertension ($p=0.68$). There has also been no correlation between headaches and the presence or absence of insomnia.

Compared to other studies, in our group the number of people consuming coffee was 10 percentage points higher than in available publications - 69.66% vs. an average of 60% in the world. [24]

Discussion

Coffee is one of the most frequently consumed drinks in the world. In our work, we confirmed a relationship between coffee consumption and the occurrence of insomnia, the impact was similar to results reported in studies on other populations. Typically, caffeine increases the time it takes to fall asleep, reduces total sleep time and sleep efficiency, and worsens perceived sleep quality. Deep sleep and slow thalamus activity on the electroencephalogram (EEG) are usually reduced, whereas stage 1 sleep, wakefulness, and arousal are increased. Differences have also been shown between the effects of caffeine on the body depending on the age of the examined person [25,26,27(p24)]. Due to the relatively monogenic group of respondents, an analysis between younger and older people was not possible.

The effect of caffeine on sports performance is widely studied. The ergogenic effect of low doses of caffeine appears to be due to changes in the central nervous system. Nevertheless, many aspects related to the consumption of low doses of caffeine remain unresolved due to a lack of research [28]. In our survey, we were able to relate body weight to the frequency of drinking coffee. However, it is not possible to determine the cause of this relationship. It may be related to many factors, e.g. lower appetite in people who drink more coffee, increased metabolism, etc. Importantly, there are publications stating that caffeine may be effective in the treatment of obesity both as monotherapy and in combination with other drugs and treatment methods [29,30].

We did not demonstrate a relationship between hypertension treatment and coffee consumption. It is worth paying attention to the young group of respondents here. In this group, hypertension most often results from a different mechanism than that developing in older people. However, there are meta-analyses showing that moderate and regular coffee consumption does not increase and may even reduce the risk of developing hypertension. Moreover, occasional coffee consumption protects against the development of hypertension [6].

Conclusions

In the study group, the frequency of coffee consumption was higher than the global average and in some cases had led to insomnia. Coffee consumption reduces body weight in drinkers,

and was not associated with an increase in the incidence of hypertension. Taking into account its stimulating properties and the lack of significant negative side effects, it is a safe drink in the group of tested Slavs.

Disclosure

Author's contribution

Conceptualization, Konrad Czchowski, and Dawid Kościołek; methodology, Martyna Kępczyk.; software, Mikołaj Tokarski; check, Michał Urbaś, Jakub Misiak and Mikołaj Tokarski; formal analysis, Kaja Surowiecka and Michał Urbaś; investigation, Konrad Szalbot and Aleksandra Kościołek; resources, Aleksandra Kościołek; data curation, Michał Urbaś ; writing - rough preparation, Kaja Surowiecka and Konrad Czchowski; writing - review and editing, Miłosz Ojdana and Jakub Misiak; visualization, Konrad Czchowski; supervision, Mikołaj Tokarski adn Konrad Szalbot; project administration, Konrad Czchowski and Aleksandra Kościołek; receiving funding - no specific funding.
All authors have read and agreed with the published version of the manuscript.

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Institutional Review Board Statement

Not applicable – Not required

Informed Consent Statement

Informed consent was obtained from all subjects involved in the study.

Data Availability Statement

Raw data available in the link below:
https://docs.google.com/spreadsheets/d/1qdxKX4d8-VagqaerWV6bD1zzsWlco9BR/edit?usp=sharing&ouid=115641600060418349532&rtpof=true&sd=true

Conflict of interest

The authors deny any conflict of interest

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