



International Journal of Innovative Technologies in Social Science

e-ISSN: 2544-9435

Scholarly Publisher
RS Global Sp. z O.O.
ISNI: 0000 0004 8495 2390

Dolna 17, Warsaw,
Poland 00-773
+48 226 0 227 03
editorial_office@rsglobal.pl

ARTICLE TITLE

COFFEE – A DAILY PLEASURE OR A SILENT ENEMY TO YOUR HEALTH?

DOI

[https://doi.org/10.31435/ijitss.4\(48\).2025.4046](https://doi.org/10.31435/ijitss.4(48).2025.4046)

RECEIVED

05 October 2025

ACCEPTED

22 November 2025

PUBLISHED

26 November 2025

LICENSE



The article is licensed under a **Creative Commons Attribution 4.0 International License**.

© The author(s) 2025.

This article is published as open access under the Creative Commons Attribution 4.0 International License (CC BY 4.0), allowing the author to retain copyright. The CC BY 4.0 License permits the content to be copied, adapted, displayed, distributed, republished, or reused for any purpose, including adaptation and commercial use, as long as proper attribution is provided.

COFFEE – A DAILY PLEASURE OR A SILENT ENEMY TO YOUR HEALTH?

Patryk Biesaga (Corresponding Author, Email: Patryk.biesaga94@gmail.com)

W. Orłowski Hospital in Warsaw, Poland

ORCID ID: 0009-0003-0242-9126

Konrad Kotte

St. Alexander Hospital in Kielce, Poland

ORCID ID: 0009-0008-9745-985X

Olaf Jadanowski

University of Health Sciences in Bydgoszcz, Poland

ORCID ID: 0009-0000-6279-3067

Kamil Łebek

Jan Kochanowski University Kielce, Poland

ORCID ID: 0009-0005-4612-5022

Przemysław Piskorz

National Medical Institute of the MSWiA, Warsaw, Poland

ORCID ID: 0009-0000-9812-2230

Daria Litworska-Sójka

Provincial Combined Hospital, Kielce, Świętokrzyskie, Poland

ORCID ID: 0009-0005-4590-3777

Bartosz Komsta

Military Institute of Medicine – National Research Institute, Warsaw, Poland

ORCID ID: 0009-0003-1159-5855

Wojciech Pabis

5th Military Research Hospital and Polyclinic, Kraków, Poland

ORCID ID: 0009-0006-3455-4724

Julia Lipiec

Independent Public Health Care Facility of the Ministry of Internal Affairs and Administration in Kielce, Świętokrzyskie, Poland

ORCID ID: 0009-0004-3351-4056

Weronika Sobota

National Medical Institute of the MSWiA, Warsaw, Poland

ORCID ID: 0009-0000-7778-7030

ABSTRACT

Introduction and purpose of the study: Coffee has been one of the most commonly consumed stimulants for over 100 years. When it first became popular, it was praised as a remedy for various ailments, although at the time there was no scientific basis for such claims. Later publications reported on the harmful effects of coffee consumption, but over the last 20-30 years, studies have increasingly confirmed the benefits of moderate coffee consumption. The aim of this study is to review the literature on the effects of coffee consumption.

Material and methods: A review of publications in Polish medical literature and the PubMed database was conducted using the keywords: coffee, caffeine, health effects.

Results: Studies confirm the benefits of moderate coffee consumption for the cardiovascular system, neurological health, and metabolism. There is a group of contraindications, mainly related to excessive caffeine consumption, which causes a risk of addiction, adverse behavioral symptoms, and tachycardia.

Conclusions: Drinking coffee in moderate amounts is safe for health. Pregnant and breastfeeding women and people at risk of osteoporosis should consider avoiding coffee or limiting its consumption. The individual effects of coffee consumption should be identified to determine whether drinking this beverage causes headaches or sleep disturbances in a given case.

KEYWORDS

Coffee, Caffeine, Health Effects

CITATION

Patryk Biesaga, Konrad Kotte, Olaf Jadanowski, Kamil Łebek, Przemysław Piskorz, Daria Litworska-Sójka, Bartosz Komsta, Wojciech Pabis, Julia Lipiec, Weronika Sobota. (2025) Coffee – a Daily Pleasure or a Silent Enemy to Your Health? *International Journal of Innovative Technologies in Social Science*. 4(48). doi: 10.31435/ijitss.4(48).2025.4046

COPYRIGHT

© The author(s) 2025. This article is published as open access under the **Creative Commons Attribution 4.0 International License (CC BY 4.0)**, allowing the author to retain copyright. The CC BY 4.0 License permits the content to be copied, adapted, displayed, distributed, republished, or reused for any purpose, including adaptation and commercial use, as long as proper attribution is provided.

Introduction

The role of coffee, which has become one of the most commonly consumed beverages, has not been clearly defined for many years.

Objective

The aim of this study is to review the available scientific literature in search of findings on the impact of coffee consumption on human health.

Material and methods

A review of publications in Polish medical literature and the PubMed database was conducted using the keywords: coffee, caffeine, health effects.

Characteristics of coffee

In most languages, coffee—an infusion made from roasted and ground coffee beans—is referred to by a word derived from its Arabic equivalent: *qahweh*, meaning "to dispel sleep" [1]. Coffee is a plant-based beverage with a complex composition, containing about a thousand substances, some of which are biologically active. The most important are caffeine (an average of 60-135 mg per cup) and chlorogenic acid, which has oxidizing properties. Trigonelline contained in coffee beans is converted into nicotinic acid during roasting, and the substances that make up the brew include other organic acids, tannins, carbohydrates, proteins, and small amounts of lipids. Coffee contains B vitamins and minerals, especially magnesium and potassium [2,3,4].

Drinking coffee provides the body with caffeine, which is quickly absorbed and metabolized. Its maximum concentration in the blood is reached within 15-20 minutes after consumption. Caffeine is metabolized in the liver by the oxidase system, and its metabolites are broken down and excreted in the urine. In a healthy adult, the half-life of caffeine in the body is 3-4 hours, but in an elderly person with chronic diseases or genetic conditions, it can increase to 11 hours. In tobacco smokers, caffeine metabolism is accelerated by up to twice as much [2,5].

The history of coffee's popularity

There are no records of the drink being used in ancient times. During the Middle Ages, coffee was certainly drunk in Ethiopia (especially in the province of Kaffa), and in the following centuries it became widespread in Arab countries. In Europe, coffee was treated with suspicion for quite a long time as a drink invented by pagans [6]. It was only after Pope Clement VIII tasted the brew made from coffee beans that he decided it would be a shame to leave such a delicacy to the infidels, so coffee should be made a Christian drink. Around the middle of the 17th century, the first English coffee house opened in London, followed by others in Paris, Amsterdam, and Hamburg. A story passed down in Polish popular science literature attributes the popularization of coffee in European countries to the entrepreneurship of a Pole, Franciszek Jerzy Kulczycki (referred to as Franz Georg Kolschitzky in German literature), who opened the first coffee house in Vienna in 1683. Kulczycki was reportedly a spy for King Jan III Sobieski and, thanks to several expeditions to Turkish territory, knew the properties of coffee. Therefore, after repelling the Turkish invasion, he became interested in the sacks full of beans left in the camp, the purpose of which the Austrians were unaware. The café founded by Kulczycki, called "Pod Niebieską Butelką" (Under the Blue Bottle), served a drink sweetened with honey, with the addition of cream and milk, sprinkled with cinnamon. In the following years, the fashion for cafés spread to most cities in Europe. In order to increase supply, in the early 18th century, the French transported coffee tree seedlings to South America. The plant took root there, initiating the development of plantations in many countries [1,2].

In Poland, the first cafés were established during the reign of the Saxons. Several decades later, Adam Mickiewicz wrote with some exaggeration in "Pan Tadeusz": "There is no coffee like that in Poland in any other country." Even then, the drink had already gained great popularity [1,2]. Worldwide, coffee currently ranks second among beverages after water in terms of frequency of consumption. In Poland, more than three-quarters of the adult population drinks at least one cup of coffee a day. In statistics recording coffee consumption in kg per year, the Finns (12 kg per person), Norwegians (9.9 kg), and Icelanders (9 kg) are in the lead, while the average Pole consumes 2-3 kg of coffee per year (data from 2021) [7,8].

Nowadays, coffee is available on the market in bean, ground, and instant forms. Instant coffee in powder or granule form was introduced in the 1930s as a product that could be stored for a long time without losing its taste and aroma, and became popular due to the ease and speed of preparation. A little earlier, in 1096, decaffeinated coffee was produced, which, contrary to its name, contains a reduced amount of caffeine thanks to the conditioning of moist green or roasted coffee beans at high temperatures [3,9].

The current cultivation of coffee trees worldwide covers more than 10 million hectares. The properties of coffee beans are influenced by climate and soil characteristics: humidity, the altitude of the plantation, and the type of fertilization. Some of the characteristics result from the way the beans are roasted. The main coffee producers are Brazil, Colombia, Vietnam, Indonesia, and Ethiopia. Every year, people consume 8 million tons of coffee. Arabica and Robusta coffees dominate the market, differing in caffeine content, flavor intensity, and aroma [2,10].

Views on the properties of coffee

Early coffee drinkers, like many modern consumers, valued it primarily for its specific taste and aroma [2]. It was noticed early on that it has diuretic properties, stimulates the heart and brain, and reduces drowsiness. In the 17th century, it was advertised as a remedy for gout, dropsy, and scurvy, but warnings were issued that it reduced potency and could damage the complexion. In the 19th century, caffeine was used to dilate the bronchi to facilitate breathing and reduce attacks of breathlessness. About a century ago, it was advertised in the United States as the best remedy for a hangover [1,9].

Medical literature from the last twenty years contains studies showing that views on the properties of coffee have gradually evolved. Previously, it was commonly believed that coffee consumption had negative effects on the body, mainly due to caffeine, which accelerates the heart rate and causes an increase in blood pressure [2,11].

Results of research on the properties of coffee

Contemporary research on coffee confirms the beneficial effects of its consumption, provided that it is consumed in moderation throughout the day. The role of coffee in the prevention of cardiovascular disease, type 2 diabetes, obesity, nervous system diseases, and cancer has been analyzed [12,13].

The effect of coffee on the cardiovascular system

Caffeine dilates blood vessels, increasing blood flow in the body and stimulating the central nervous system. Changes in blood pressure are related to stimulation of the sympathetic nervous system, increased release of norepinephrine, and activation of the renin-angiotensin-aldosterone system. A dose of 240-250 mg of caffeine causes an increase in blood pressure: significant in people who do not usually drink coffee, but slight in people who consume this beverage regularly. However, a 2014 meta-analysis indicated that consuming 3-5 cups of coffee per day reduces the risk of cardiovascular disease, as chlorogenic acid and certain other bioactive compounds alleviate oxidative stress and improve vascular endothelial function [2,14].

A 2023 publication indicated that drinking 1-3 cups of coffee a day reduces the risk of developing hypertension by 7% to 21%, and that regular and long-term coffee consumption does not have a hypertensive effect in people with existing hypertension. The results of studies on the relationship between coffee consumption and the risk of developing ischemic heart disease are contradictory and have not allowed for clear conclusions to be drawn. Other analyses have found that people who drink 2-3 cups of coffee a day and choose ground coffee have lower rates of cardiac death [7,11,15].

The effect of coffee on metabolism

Regular caffeine intake improves glucose metabolism and reduces the risk of developing diabetes. Chlorogenic acid and magnesium, which are found in coffee, are also important as they reduce fasting plasma glucose levels and improve cell sensitivity to insulin [16]. Prospective studies suggest that each cup consumed per day reduces the risk of diabetes by 7%, and regular coffee drinkers have an 11% lower overall risk of developing diabetes compared to the non-coffee-drinking population. It is also likely that coffee consumption reduces the risk of obesity, as chlorogenic acid intensifies the breakdown of adipose tissue, and caffeine limits the absorption of fatty acids in the intestinal lumen [2,11].

The effect of coffee on nervous system diseases

A meta-analysis of more than 20 studies indicates that daily coffee consumption (at least 3 cups per day) reduces the risk of neurodegenerative disorders, such as Parkinson's disease (25% reduction in risk), Alzheimer's disease, and late-onset dementia [17]. The effectiveness of caffeine in this regard is related to its ability to stimulate the central nervous system, which builds neuroprotection potential. It has also been found that moderate and long-term coffee consumption reduces the risk of depression by 9-20% or alleviates its symptoms, as caffeine modulates the release of serotonin [2,5,12].

The impact of coffee on cancer risk

Coffee has no carcinogenic properties, and chemoprevention studies are focused on determining the effects of consuming the phytochemicals contained in the beverage. It has been proven to have a strong antioxidant effect and to strengthen the resistance of DNA molecules to the effects of oxygen free radicals [6]. Coffee acid slows down the process of cancer initiation by intensifying apoptosis and regulating the cell cycle. It is therefore assumed that coffee may help eliminate oxidative damage to genetic material and have anti-inflammatory and antioxidant effects. It is considered likely that coffee consumption reduces the risk of colorectal cancer because it stimulates intestinal peristalsis and bile acid excretion [2,18].

The effect of coffee on the risk of osteoporosis

Drinking more than 4 cups of coffee a day potentially increases the risk of osteoporosis. Caffeine consumed in this amount interferes with the absorption of macronutrients, such as calcium and magnesium, which over time can lead to a deficiency of these elements and changes in bone structure. Some studies indicate that consuming more than 8 cups of coffee a day increases the risk of bone fractures in women by 14%, but moderate consumption (up to 400 mg per day) does not have such negative consequences. However, it should be noted that caffeine is also absorbed through the consumption of tea, Coca-Cola, and chocolate, which, together with coffee drinking, may pose a risk to bones. The recommended countermeasure for coffee drinkers is to ensure an adequate supply of calcium and vitamin D in their diet [2,19].

Recommendations for coffee consumption and contraindications

Moderate caffeine consumption is defined as approximately 200 mg per day for healthy adults (dose set by the European Food Safety Authority). This amount is equivalent to 3-4 espressos or 2-3 cups of instant coffee or two cups of Turkish black coffee. However, it should be noted that the caffeine content in a serving of coffee depends on the type and method of preparation. It should also be remembered that caffeine is also found in so-called decaffeinated coffee (about 1-5 mg per cup), tea (20-45 mg per glass) and chocolate. Energy drinks have a higher caffeine content, with an average of 70-120 mg of caffeine in 330 ml [2,4,14].

According to experts, even a dose of caffeine increased to 400 mg per day should not cause adverse effects. However, this does not apply to pregnant women, who should limit their caffeine intake to 200 mg per day due to the risk to the fetus [2].

Long-term consumption of 400-800 mg of caffeine per day is considered a dangerous dose – such consumption can lead to the development of addiction and adverse symptoms, such as irritability, nervousness, sleep disorders, and tachycardia. A lethal dose of caffeine is considered to be 150-200 mg/kg of body weight [2].

The health risks of drinking excessive amounts of coffee result from the intake of oxalates, which have anti-nutritional properties. This substance is abundant in tea and coffee, and their consumption provides 80-85% of the total oxalate intake in the body. Other products containing oxalic acid, such as spinach, sorrel, rhubarb, cocoa, beets, and legume seeds, are less common in the diet. Oxalate absorbed in the diet hinders the utilization of other minerals, such as calcium. A cup of strong ground coffee contains 90-160 mg of oxalate, while coffee prepared from beans contains 30-100 mg of oxalate per cup. The daily intake of oxalates should not exceed 250 mg. Excess oxalate often leads to the development of kidney stones [3]. Due to its oxalate content, coffee should be avoided by people with inflammatory bowel disease, digestive disorders, prolonged constipation, or diarrhea [8].

There are no clear research results on the relationship between coffee consumption and migraines. Most likely, it depends on the individual characteristics of consumers, as some people confirm pain relief after drinking coffee, while others find that this drink causes migraine headaches [10]. The habit of drinking coffee can affect sleep and wakefulness patterns. Moderate consumption, especially when regular, should not cause a higher risk, but individual reactions to the drink should be monitored. Some people have trouble falling asleep or cannot get deep sleep even several hours after drinking coffee [5,15,20]. Due to the stimulating properties of caffeine, coffee is not recommended for people with mental illness, especially since the drink can inhibit the effects of medications used in therapy [9]. Many coffee consumers appreciate it for its ability to aid concentration, reduce drowsiness, improve reaction time, and stimulate the body when a person begins to feel tired while working or driving [21,22,23]. For this reason, small doses of coffee can be used to stimulate patients after drug or alcohol poisoning [24]. Studies also indicate that the stimulating effect of coffee contributes to the fact that medical personnel are a group characterized by high consumption of this beverage [25,26].

It is recommended that pregnant women do not drink coffee containing more than 150 mg of caffeine per day. Even moderate amounts of caffeine, and even more so large doses, increase the risk of pregnancy loss due to premature birth or fetal death. It also increases the risk of giving birth to a baby with low birth weight [5,10,27]. It is also not recommended for breastfeeding women to drink coffee [28]. In addition, caffeine interacts with certain medications, which must be taken into account when planning pharmacotherapy, e.g., with fluvoxamine used to treat depression, ketoprofen, or methotrexate [25].

Summary

Coffee is a very popular drink due to its taste and aroma. The biologically active compounds it contains have a multidirectional effect on the human body. The effects of drinking coffee can vary depending on the type of coffee, the method of preparation, the frequency of consumption, and the consumer's health conditions.

Conclusions

1. Drinking coffee in moderate amounts is safe for health.
2. Pregnant and breastfeeding women and people at risk of osteoporosis should consider avoiding coffee or limiting its consumption.

The individual effects of coffee consumption should be identified to determine whether drinking this beverage causes headaches or sleep disturbances in a given case.

REFERENCES

1. Michałowska M.: Przez kuchnię i od frontu. Wydawnictwo Polskiego Towarzystwa Wydawców Książek, Warszawa 1988, 63-72.
2. Pelczyńska M. Bogdański P.: Prozdrowotne właściwości kawy. *Varia Medica* 2018, 4, 311-317.
3. Ulewicz-Magulska B. Pawełekiewicz J. Wesołowski M.: Kawa źródłem antyodżywczych szczawianów w diecie człowieka. *Farmacja Polska* 2018, 4, 206-209.
4. Dąbrowska-Molenda M. Szwedziak K. Zabłudowska Ż. Analiza zawartości kofeiny w wybranych rodzajach kawy. *Postępy Techniki Przetwórstwa Spożywczego* 2019, 2, 68-71.
5. Kabzińska D.: Kawa i jej wpływ na zdrowie, cz. 2. <https://www.biotechnologia.pl/artukul-kawa-i-jej-wplyw-na-zdrowie-cz2.pdf>, 10.11.2024.
6. Kobylńska Z. Biesadecki M. Kuna E. Galiniak S. Mołoń M. Coffe as a Source of Antioxidations and an Elixir of Youth. <https://www.mdpi.com/2076-3921/14/3/285>, 30.05.2025.
7. Sławiński A. Klein P. Górecka Z.: Czy picie kawy może wydłużyć życie? – czyli co wiemy o wpływie spożycia kawy na zdrowie układu sercowo-naczyniowego. *Medycyna Środowiskowa* 2024, 27, 3, 110-114.
8. Gunter M. J. Murphy N. Cross A. J. et al. Coffee drinking and mortality in 10 European contries: A multinational kohort study. *Ann Intern Medicine* 2017, 167u, 4, 236-247.
9. Żakiewicz-Sobczak W. Krasowska E. Sobczak P. Horoch A. Wojtyła A. Piątek J.: Wpływ spożycia kawy na organizm człowieka. *Medycyna Ogólna i Nauki o Zdrowiu* 2012, 18, 1, 71-76.
10. Baran J. Kubit P.: Kawa i jej prozdrowotne właściwości. *Herbalism* 2021, 1 (7), 19-30.
11. Moszczyński P.: Wpływ kofeiny i kawy na zdrowie: przegląd medycznych faktów i met analiz licznych wyników. *Lek w Polsce* 2019, 2, 36-42.
12. Barczak A.: Rola kawy w zapobieganiu otępieniu. *Aktualności Neurologiczne* 2019, 19 (2), 97-102.
13. Bedaso Z. A. Jilo K. R. Coffe consumption benefots and risk on human health. *J Med. Biol* 2022, 4 (1), 41-52.
14. O'Keefe J. H. DiNicolantonio J. J. Lavie C. J.: Coffe for cardioprotection and longevity. *Prog Cardiovasc Dis* 2018, 61, 38-42.
15. Palian J. Mordarski J. Tokarczyk W. Mazur A.: Kawa – główne źródło kofeiny i jej wpływ na funkcjonowanie mózgu. [w:] *Zachowania prozdrowotne jako element aktywności człowieka. Tom V. red. G. Bejda, J. Lewko, E. Krajewska-Kułak. Uniwersytet Medyczny w Białymstoku, Białystok* 2024, 168-174.
16. Perszke M. Egierska D. Potential health benefits from coffee consumption. *Journal of Education, Health and Sport* 2022, 12 (10), 11-18.
17. Socąła K. Szopa A., Serefko A. Poleszak E. Wlaż P. Neuroprotective effects of coffee bioactive compounds: A review. *Int J Mol Sci* 2021, 22 (2), 1-64.
18. Grosso G. Godos J. Galvano F.: Cofffe, caffeine and Health outcomes. *Annual Review of Nutrition* 2017, 37, 131-156.
19. Kwiatkowska I. Lubawy M. Formanowicz D. Postępowanie żywieniowe w prewencji osteoporozy u osób starszych. *Geriatra* 2019, 13, 177-183.
20. Gromny I. Ocena ryzyka osteoporozy u pacjentów z chorobą Leśniowskiego Crohna w zależności od poziomu wapnia i 25-hydroksywitminy D w surowicy krwi. *Uniwersytet Medyczny im. Piastów Śląskich we Wrocławiu, Wrocław* 2022.
21. Magalhaes R. Rico-Perez M. Esteves M. et al.: Habitual coffee drinkers display a distinct pat tern of brain functional coeectivity. *Mol Psychiatry* 2021, 26, 6589-6598.
22. Richard P. Console J. The most common causes of collision. *The National Law Review* 2020, 10, 2-5.
23. Bernat K. Mystkowska I. Kofeina jako kluczowy składnik suplementów diety dla sportowców. *Herbalism* 2025, 1 (11), 103-114.
24. Krystosial K. Kietliński S. Niwiński M. Kornacki M. Kofeina w życiu człowieka. spożycie produktów kofeinowych przez młodych dorosłych. *Szkoła Główna Gospodarstwa Wiejskiego w Warszawie, Warszawa* 2023.
25. Balawejder-Biśto A. Pyka-Pająk A. Kofeina –substancja znana czy poznawana. *Farmacja Polska* 2022, 78 (8), 430-442.
26. Willson C. The clinical toxicology of caffeine: A review and cese study. *Toxicology Reports* 2018, 5, 1140-1152.
27. Luchowska A. Sroczyńska M. Żaczek A. Caffeine Materna intake and its effecr on low birth weight of newbors – a literature review. *Journal of Education, Health and Sport* 2023, 13 (2), 93-97.
28. Vecchia LaC.: Coffe and health. <https://www.coffeeandhealth.org>, 10.11.2024.