Coffee and **Mental Performance**

Key Points

- Coffee can support alertness and attention, with benefits observed from around one regular cup of coffee (around 75 mg of caffeine).
- Regular coffee consumption has been associated with a lower risk of cognitive decline and neurodegenerative conditions. The most favourable associations have been observed with moderate caffeinated coffee consumption, around 2-3 cups per day.
- Coffee can affect sleep, but responses vary considerably between individuals.
- Caffeine may improve mood and reduce fatigue, although these effects are generally temporary.

Background

Coffee is a popular beverage choice, valued for its taste and also its ability to support concentration and alertness. This effect can be beneficial during monotonous tasks, but may also negatively impact sleep quality in some individuals.

Alertness

- The European Food Safety Authority (EFSA) concluded that a serving of 75 mg of caffeine (around one regular cup of coffee) can boost selective attention (focusing on the relevant stimulus) and sustained attention (maintaining focused attention over an extended period of time)[1].
- Higher caffeine intakes do not necessarily result in additional increases in alertness[2].
- **Driving:** Caffeine is associated with faster response times and improved accuracy, and may help maintain vehicle control in sleep-restricted drivers[3]. Coffee and other caffeinated beverages have also been associated with a lower risk of crashes among long-distance commercial drivers[4].

Cognitive performance

- Observational studies have reported associations between coffee consumption and a lower risk of some neurodegenerative conditions and dementia, although findings vary by outcome and coffee type[5].
- A large prospective cohort study of more than 130,000 adults found that higher intake of caffeinated coffee was associated with an 18% lower risk of dementia, with the most pronounced benefits observed at approximately 2-3 cups per day[6].
- While the mechanisms are not fully understood, coffee contains caffeine, polyphenols and other bioactive compounds that may exert neuroprotective and anti-inflammatory effects.

Watch Coffee and its Effect on the Brain

Sleep

- A systematic review concluded that the effects of caffeine on sleep vary considerably between individuals and may be influenced by factors such as age, sensitivity levels, regular coffee and caffeine intake, time of consumption and genetic variability[7]. Individuals may learn to regulate coffee consumption to fit their individual patterns of response.
- Commonly reported effects include taking longer to fall asleep, shorter sleep duration, reduced deep sleep and more frequent awakenings[7].
- Sleep disruption is more likely when caffeine is consumed closer to bedtime, with alterations in sleep quality observed following intake of 400 mg of caffeine (approximately 4-5 cups of coffee, although caffeine content varies by beverage/serving)[8].

Mood

- Research suggests that caffeine may help relieve depressive symptoms or help protect against depression: a 2016 meta-analysis showed a dose-responsive J-shaped curve improving depressive symptoms up to ~300mg per day[9]. Other studies have shown improvements without linear dose-response effects[10,11].
- Research suggests that any effects of caffeine on mood are generally modest and temporary, with physiological effects that are largely reversible[2].

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Safety considerations

Moderate coffee consumption may support alertness, cognitive performance and mood, especially when tired. The European Food Safety Authority's (EFSA) review on the Safety of Caffeine concluded that moderate caffeine consumption, of around 400 mg of caffeine per day (the equivalent of up to 5 cups of coffee), can be enjoyed as part of a healthy balanced diet and an active lifestyle. EFSA also concludes that in pregnancy, the daily caffeine limit should be 200mg from all sources[12].

References

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