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EFFECT OF CAFFEINE AND SLEEP DEPRIVATION

S. ZUKOWSKI

INTRODUCTION

The routine is the same for a lot of people. One of the first things in the morning, aside from showering, getting dressed, and eating breakfast, a cup of coffee is a regular part of our morning ritual. It helps us get moving in the morning and keeps us alert and ready for whatever the day may throw at us. But it isn't just the coffee itself that provides us with this motivation. It is the caffeine that coffee contains. Caffeine keeps us moving throughout the morning and maybe throughout the day, but it could have effects on us in other ways. A question arises when considering caffeine consumption: since caffeine keeps us awake, does it also affect our sleeping patterns? And if so, how? This paper seeks to find an answer to this question and to get an understanding of exactly how caffeine works and how it affects us.

ANALYSIS

Caffeine is a psychoactive substance. It enhances certain aspects of how our brains work, including attention and alertness. (McLellan, Riviere, Williams, McGurk, & Lieberman, 2018) It is the most widely consumed psychoactive substance in North America and is popular throughout the world. In fact, about 80% of Americans consume caffeine on a regular basis. (McLellan, Riviere, Williams, McGurk, & Lieberman, 2018) It is conventional wisdom that coffee makes us more alert and can wake us up when we feel tired and groggy. In fact,

studies show that in the short term, caffeine provides performance and alertness enhancement. (Wesensten, Killgore, & Balkin, 2005)

Caffeine is available in many drinks and foods and naturally occurs in such products as coffee, tea, and chocolate. It is also an additive in sodas. (Wesensten, Killgore, & Balkin, 2005) Energy drinks are also popular, with the latter being especially popular among younger male military personnel and civilians. (McLellan, Riviere, Williams, McGurk, & Lieberman, 2018) Caffeine has also been found to have benefits for drivers. Driver sleepiness is a problem that accounts for nearly $\frac{1}{4}$ of vehicle crashes in the UK, 10% of them in France, and 1-3% of accidents in the US. (Heatherley, 2011) It has been found that caffeine has been shown to decrease reaction time and improve performance, therefore helping sleepy drivers in staying alert and responsive to road conditions. (Heatherley, 2011)

When it comes to military members, the rate of caffeine consumption depends on their duties. McLellan et al. (2018) conducted a survey of American military personnel who were deployed in Afghanistan in the spring and summer of 2012 to get an understanding of not only caffeine consumptions among military personnel, but the effects that it has on their sleep patterns. In their research, they found that about 30% of non-deployed military members consume at least one energy drink a week. (McLellan, Riviere, Williams, McGurk, & Lieberman, 2018) For deployed members, this number increases to between 45% and 81% during combat missions. (McLellan, Riviere, Williams, McGurk, & Lieberman, 2018) As a result of the energy drinks, there are some military members that have reported problems with their sleep being interrupted or having difficulty falling asleep. (McLellan, Riviere, Williams, McGurk, & Lieberman, 2018)

It is not just military personnel that have begun consuming energy drinks in large numbers. Energy drink consumption has increased among young people in Canada and elsewhere. In 2015, a study by Hammond, Reid, and Zukowski found that almost $\frac{3}{4}$ of Canadians between the ages of 12-24 have consumed at least one energy drink in their lifetime. (Hammond, Reid, & Zukowski, 2018) Survey research was conducted to not only determine the rate of consumption but also if anyone experienced adverse effects. The adverse effects of caffeine were more pronounced in this population. (Hammond, Reid, & Zukowski, 2018)

In the survey of Canadian adolescents and young adults, it was found that over 55% of those who had consumed an energy drink experienced at least one adverse effect including heart palpitations, nausea/vomiting, chest pain, and seizures. (Hammond, Reid, & Zukowski, 2018) However, something that should be considered is how caffeine is combined with other stimulants. For example, energy drinks typically contain other stimulants aside

from caffeine and there may be some effects as a result of this combination that have not yet been fully evaluated. (Hammond, Reid, & Zukowski, 2018)

While caffeine can increase alertness and enhance performance, it can also lead to even further sleep deprivation than what it attempts to help its users through. This is especially true of adolescents, as a study by Carskadon and Tarokh (2014) shows us. Adolescent development involves changes not only physically but mentally, and this includes the circadian rhythms. (Carskadon & Tarokh, 2014) Substances such as caffeine can further interrupt the changes that are happening, causing adolescents to sleep too late and too little. In fact, those who experience this most consume more caffeine than their peers. (Carskadon & Tarokh, 2014)

CONCLUSION

Conventional wisdom and scientific studies have shown that caffeine can have the effect of being a “pick me up” when an extra energy boost is needed. However, moderation is important. Too much caffeine can have some adverse side effects that can be serious. Also, caffeine can perpetuate the very problem it helps. It can make sleep deprived continue having trouble sleeping. However, there some short-term benefits to caffeine use when it comes to alertness and performance. A lot of adverse effects associated with energy drinks to not take into account the other added substances and there is not a lot of research into how the added ingredients could possibly react with caffeine. Perhaps a little more research in to how caffeine acts with other ingredients can help us get a better idea of how to properly regulate its use and how it is added into the things we consume.

REFERANCE

1. Carskadon, M., & Tarokh, L. (2014). Developmental changes in sleep biology and potential effects on adolescent behavior and caffeine use. *Nutrition Reviews*, 60-64.
2. Hammond, D., Reid, J., & Zukowski, S. (2018). Adverse effects of caffeinated energy drinks among youth and young adults in Canada: a Web-based survey. *Canadian Medical Association Journal*, E19-E25.
3. Heatherley, S. (2011). Caffeine withdrawal, sleepiness, and driving performance: What does the research really tell us? *Nutritional Neuroscience*, 89-95.
4. McLellan, T., Riviere, L., Williams, K., McGurk, D., & Lieberman, H. (2018). Caffeine and energy drink use by combat arms soldiers in Afghanistan as a countermeasure for sleep loss and high operational demands. *Nutritional Neuroscience*, 1-10.