

# Energy Drink Consumption in Adolescence Linked to Long Term Health Effects

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## Abstract

Caffeine is a substance that is frequently ingested by individuals for a multitude of reasons, most often an energy boost. Recently, caffeine consumption has become popular among the adolescent population. We reviewed 15+ recent studies explaining the adverse effects of caffeine consumption among adolescents such as cognitive function, mental illness, and obesity. Numerous correlations were found including lower scores in several cognitive functions such as vocabulary comprehension, cognitive flexibility, and processing speeds, mental illnesses such as stress, anxiety, and depression, and the immense sugar-content in these beverages being linked to childhood obesity. It is important that healthcare professionals are aware of the implications of adolescent caffeine use and caution patients on these findings.

## Cognitive Function

Caffeine intake in adolescence has been found to be associated with lower scores in several cognitive functions including vocabulary comprehension, cognitive flexibility, and processing speeds.<sup>5,6</sup> Energy drinks contain high levels of additives such as Taurine, an amino acid that is naturally found in the body.<sup>5,6</sup> A recent 2020 study of the cognitive effects of excessive Taurine exposure in mice revealed findings similar to what is found in energy drinks.<sup>5</sup> Both Taurine male and female mice expressed impaired spatial learning and memories.<sup>5</sup> This data indicates that adolescent brains are somewhat vulnerable to Taurine exposure which is concerning given the increased consumption of energy drinks among adolescents.

Cognitive function impairment not only disrupts daily activities and learning but can result in long-term effects as the adolescent brain is still continuing to develop. Additionally, authors Curran and Marczinski discuss that while adult brains may actually benefit from caffeine and controlled Taurine consumption, adolescent brains experience negative long-term effects including an increase in heart rate, blood pressure, blood glucose levels, and bronchodilation.<sup>6</sup> These medical manifestations can certainly be a danger to the adolescent brain resulting in impaired cognitive functioning with long-term use.<sup>5,6</sup>

## Mental Illness

Excessive caffeine consumption has been found to be a predictor of high levels of stress, anxiety, and depression.<sup>7,8</sup> Although there is an abundance of triggers that can lead to depressive disorders in children, there has been growing evidence that environmental factors such as frequent caffeine use can play a role in these disorders. Caffeine stimulates the peripheral and central nervous systems, causing excitability and stimulant-like effects.<sup>9</sup> When these chemicals later plummet, negative feelings have been found to arise such as anxiety and depression, especially among school-aged children.<sup>9</sup>

In addition to anxiety and depression, ADHD and sleeping problems has also been linked to caffeine use among adolescents. A study of 302 individuals aged 12-14 included 140 children who had a diagnosis of ADHD and 162 children who did not.<sup>10</sup> Results showed that adolescents who consumed caffeine in the afternoons and evenings had more sleeping problems, regardless of ADHD diagnosis or not. There is also an association between adolescents with ADHD and poorer sleep habits, regardless of caffeine use. This research indicates a correlation between caffeine use and sleep disturbances.<sup>10</sup>

## Obesity

One of the main health issues affecting adolescents today is obesity.<sup>11,12</sup> In fact, the CDC reports that 1 in 5 children today are affected by childhood obesity globally.<sup>11</sup> One possible cause leading to excess caloric intake among youth may be energy drinks. A recent study of over 30,000 adolescents, found that soda and energy drinks were the largest source of added sugars among the participants at 34.4%.<sup>12</sup> Additional research has shown that children have an increased BMI of 0.06 per serving of caffeine consumed compared to their peers who did not consume caffeine.<sup>13,14</sup>

## Conclusion

Energy drink consumption continues to be on the rise worldwide and has been linked to negative health effects including reduced cognitive functioning, mental illness, and obesity. As the growing demand of energy drinks continues, individuals need to be well in-tune with their health when choosing to consume these beverages. We recommend that both adolescents and their guardians are educated on the current research from healthcare providers as these vulnerable individuals develop into adults.

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