

Cranky today? Even mild dehydration can alter our moods

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Most people only think about drinking water when they are thirsty; but by then it may already be too late.

Even mild dehydration can alter a person's mood, [energy level](#), and ability to think clearly, according to two studies recently conducted at the University of Connecticut's Human Performance Laboratory.

The tests showed that it didn't matter if a person had just walked for 40 minutes on a treadmill or was sitting at rest – the adverse effects from mild dehydration were the same. Mild dehydration is defined as an approximately 1.5 percent loss in normal water volume in the body.

The test results affirm the importance of staying properly hydrated at all times and not just during exercise, extreme heat, or exertion, says Lawrence E. Armstrong, one of the studies' lead scientists and a professor of physiology in UConn's Department of Kinesiology in the Neag School of Education.

"Our thirst sensation doesn't really appear until we are 1 [percent] or 2 percent dehydrated. By then dehydration is already setting in and starting to impact how our mind and body perform," says Armstrong, an international expert on hydration who has conducted research in the field for more than 20 years. "Dehydration affects all people, and staying properly hydrated is just as important for those who work all day at a computer as it is for marathon runners, who can lose up to 8 percent of their body weight as water when they compete."

Separate groups of young women and men were tested. Twenty-five women took part in one study. Their average age was 23. The men's group consisted of 26 men with an average age of 20. All of the participants were healthy, active individuals, who were neither high-performance athletes nor sedentary – typically exercising for 30 to 60 minutes per day.

Each participant took part in three evaluations that were separated by 28 days. All of the participants walked on a [treadmill](#) to induce dehydration, and all of the subjects were hydrated the evening before the evaluations commenced. As part of the evaluation, the subjects were put through a battery of cognitive tests that measured vigilance, concentration, reaction time, learning, memory, and reasoning. The results were compared against a separate series of tests when the individuals were not dehydrated.

In the tests involving the young women, mild dehydration caused headaches, fatigue, and difficulty concentrating, according to one of the studies, which appears in the February issue of *The Journal of Nutrition*. The female subjects also perceived tasks as more difficult when slightly dehydrated, although there was no substantive reduction in their cognitive abilities.

In the tests involving the young men, mild dehydration caused some difficulty with mental tasks, particularly in the areas of vigilance and working memory, according to the results of the second UConn study. While the young men also experienced fatigue, tension, and anxiety when mildly dehydrated, adverse changes in mood and symptoms were "substantially greater in females than in males, both at rest and during exercise," according to the study. The men's study was published in the *British Journal of Nutrition* in November 2011.

"Even mild dehydration that can occur during the course of our ordinary

daily activities can degrade how we are feeling – especially for women, who appear to be more susceptible to the adverse effects of low levels of dehydration than men," says Harris Lieberman, one of the studies' co-authors and a research psychologist with the Military Nutrition Division, U.S. Army Research Institute of Environmental Medicine in Natick, Mass. "In both sexes these adverse mood changes may limit the motivation required to engage in even moderate aerobic exercise. Mild dehydration may also interfere with other daily activities, even when there is no physical demand component present."

Why women and men are so adversely affected by [mild dehydration](#) is unclear, and more research is necessary. But other research has shown that neurons in the brain detect dehydration and may signal other parts of the brain regulating mood when dehydration occurs. This process could be part of an ancient warning system protecting humans from more dire consequences, and alerting them to the need for water to survive.

In order to stay properly hydrated, experts like Armstrong recommend that individuals drink eight, 8-ounce glasses of water a day, which is approximately equivalent to about 2 liters of water. People can check their hydration status by monitoring the color of their urine. Urine should be a very pale yellow in individuals who are properly hydrated. Urine that is dark yellow or tan in color indicates greater dehydration. Proper hydration is particularly important for high-risk groups, such as the elderly, people with diabetes, and children.

Provided by University of Connecticut

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