Does daylight saving time affect marathon runners?

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Students run along the race course during the Jingle Bell 5K Run at the UGA Golf Course. Credit: Andrew Davis Tucker/UGA

Marathon runners hoping to improve their running times may need to avoid participating in races that take place on one particular spring day

each year.

A new University of Georgia research paper co-authored by Patrick O'Connor, professor in the Mary Frances Early College of Education's Department of Kinesiology, details the effects on marathon run performance when taking place on daylight saving time transition days.

The paper, "Marathon run performance on daylight savings time transition days: results from a natural experiment," was published in the journal *Chronobiology International* in September 2021. O'Connor co-authored the paper with Mihaela Kancheva, a college alumna and current medical student at the University of Central Florida.

"Because shifting clocks by even one hour in the spring and fall temporarily disrupts sleep and mood, we wondered if human performance also would be disrupted," O'Connor said.

O'Connor and Kancheva obtained average run times for all finishers in marathon runs on the spring and fall daylight saving time transition days from a database for the years 2000-2018. They also compared runs on the same marathon courses when they were not held on a daylight saving time transition day.

Other data collected includes temperatures on race days and the latitude, longitude and altitude of each city where the races took place. O'Connor and Kancheva looked at 18 marathons and control races that occurred in the spring, compared to 29 marathons and control races that took place in the fall. Locations for marathons ranged from major cities like Los Angeles, New York City and Washington, D.C., to smaller races in towns like Frankenstein, Missouri, and Van Wert, Ohio.

After adjusting for the number of marathon runners in each race, they found that average running time was worse by about 12 minutes on the

spring daylight saving time day. In contrast, there was no worsening of performance for the marathons held on the autumn daylight saving time transition day.

O'Connor said there is not a conclusive answer to explain the discrepancy in runner performance seen in the spring but not in the fall.

"However, I speculate that slowed run time in the spring is either due to sleep loss or the shift in the timing of the race in relation to the runners' internal biological clock—our bodies work best when our body clock is in synchrony with the environmental time, and on shift days this timing is disrupted for a day or so," he said.

He said the influence of these variables may put the spring marathon runners in a worse mood or make the run be perceived as more effortful than usual.

"Marathon directors often strive to create enjoyable, fast courses such as by minimizing hills and avoiding dates likely to have hot, humid weather," O'Connor said.

"Now, these directors—and marathon runners who seek to set personal record times—may want to avoid a marathon race on a spring daylight saving time day."

More information: Patrick J. O'Connor et al, Marathon run performance on daylight savings time transition days: results from a natural experiment, *Chronobiology International* (2021). DOI: 10.1080/07420528.2021.1974471

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