

Face masks do not increase body temperature during exercise in the heat

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Student using treadmills at the Rec Center on September 21, 2020. Credit: UConn photo/SeanFlynn

With the start of the COVID-19 pandemic, face masks became a normal part of doing just about any activity outside the house.

When the federal Centers for Disease Control and Prevention (CDC) recommended wearing a mask especially during indoor activity, some raised concerns about how this could affect those exercising, especially in hot summer temperatures.

Ayami Yoshihara, director of Sport Safety at UConn's Korey Stringer Institute, recently published a paper in *Sports Health* demonstrating that exercising in the heat with a [face mask](#) on does not significantly increase body temperature or [heart rate](#) during exercise.

Yoshihara tested four kinds of face mask: a [surgical mask](#); an N95 respirator; a gaiter, which covers the neck and goes over the nose and mouth; and a sport mask. None of them significantly increased body temperature or heart rate compared to the group without a face mask.

As recommendations changed rapidly over the course of the pandemic and differed across organizations and [geographic areas](#), there was a significant need for scientific guidance. This study is the first to provide evidence to demonstrate that masks do not add any risk to health when worn during exercise in the heat.

Participants walked or jogged for 60 minutes in a 90 degree-Fahrenheit environment at low to moderate exercise intensities.

"Before this study no one knew if wearing a mask in the heat would add additional stress to an exercising individual. While we know masks are important to prevent transmission of COVID-19, we didn't know if exercising with a mask in the heat, where your body is already managing additional stressors, would impact safety," Yoshihara says.

Yoshihara and her team also measured the humidity and temperature inside and outside of the face mask. They placed a sensor inside and outside of the facemasks on participants' [faces](#).

They found the sport mask and gaiter became significantly more humid as the materials absorbed more sweat and water vapor from exhaled air.

While participants did report a greater degree of breathing discomfort during exercise with a facemask because of the changes in humidity and temperature inside of the face mask, there was no relationship between reported discomfort and measures of body [temperature](#) and heart rate.

Yoshihara hopes this research can help shape guidelines for athletes who are exercising and competing during the summer and into the fall while ambient temperatures are still high, especially as vaccination rates outside the U.S. remain low.

"It's feasible and safe to use masks during low to moderate intensity exercise in the heat," Yoshihara says.

While this study did not look at how well these [masks](#) prevent the spread of COVID-19, Yoshihara says this is a future area of study she is interested in investigating. She says it is important that face mask recommendations promote safety both in terms of exertional heat illness and airborne virus transmission.

More information: Ayami Yoshihara et al, Effects of Face Mask Use on Objective and Subjective Measures of Thermoregulation During Exercise in the Heat, *Sports Health: A Multidisciplinary Approach* (2021). [DOI: 10.1177/19417381211028212](https://doi.org/10.1177/19417381211028212)

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