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BEATING THE HEAT

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**RESEARCH ASSOCIATE PROFESSOR JASON LEE**, the paper's senior author from the Yong Loo Lin School of Medicine at National University of Singapore.



# Drinking water not best way to cool body, study finds

**Having aerobic fitness, acclimatising to heat and cooling before exercise seen to be more effective in fighting heat**

**Lim Min Zhang**

Drinking water is not the best way to lower body temperature, scientists in Singapore have found.

Cooling before exercise, being heat acclimatised and having good aerobic fitness are all better ways to

maximise performance in a hot environment, a recent study found.

The findings could help athletes – and even people in occupational settings, like soldiers, firefighters and policemen – fight the heat.

“We found that fluid ingestion did not have a significant impact on slowing the rate of increase of body

core temperature during exercise,” said Research Associate Professor Jason Lee, the paper's senior author from the Yong Loo Lin School of Medicine at National University of Singapore (NUS).

On the other hand, a person having high aerobic fitness – one of the other three methods studied – is associated with an increased capacity to take heat stress. In terms of their ability to influence core body temperature, heat acclimatisation came in second, followed by pre-ex-

ercise cooling, then fluid ingestion.

“Drinking of water has often been overemphasised. On the other hand, training to improve aerobic fitness provides a better way of maximising performance under heat stress,” Prof Lee told *The Straits Times*.

The paper, titled *Efficacy Of Heat Mitigation Strategies On Core Temperature And Endurance Exercise: A Meta-Analysis*, was co-written by NUS Graduate School for Integrative Sciences and Engineering PhD stu-

dent Sharifah Badriyah Alhadad and senior defence research scientist at DSO National Laboratories Pearl Tan. It was published in the *Frontiers in Physiology* journal on Feb 13, as part of a call for scientific papers ahead of the Tokyo Olympics in 2020. It is one of the top journals in the field in terms of the number of citations.

The paper analysed 118 studies from around the world and sought an objective “evidence-based” approach to rank the four methods of managing heat stress.

While the paper acknowledges that using a combination of the different methods would be the most beneficial, due to time and resource constraints, it might not be practical to do so all the time, hence the value in ranking them.

One caveat, however, is that using all these strategies does not guarantee protection against heat injury, as there are other factors to be considered.

Ms Sharifah said: “While core temperature is a key contributor to heat injury, there are other factors that play a part in causing heat injury, such as an individual's motivation in pushing beyond his limits.”

Prof Lee added: “Part of what this study shows is that training effectiveness and safety are not at different ends of the spectrum. Reducing training quality in hope of reducing heat injuries is certainly not recommended.”

Dr Benedict Tan, who is chief and senior consultant for sport and exercise medicine at Changi General Hospital, said that aerobic fitness gives athletes in many sports significant performance advantage.

“This study not only reinforces the value of aerobic fitness, but it also illustrates one of the mechanisms – superior thermoregulation – through which an aerobically fit athlete achieves superior performances,” said Dr Tan, who was not involved in the study.

Thermoregulation refers to the natural ways a person loses heat, such as through sweating.

He added that “practically all” the heat mitigation strategies used in sports can be translated to the military and other occupational settings. For example, suits worn by bomb disposal personnel retain a lot of heat, and pre-cooling would be a useful strategy, he said.

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