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Too hot to handle

With many front-line workers donning personal protective equipment (PPE) amid the Covid-19 pandemic, Singapore researchers, working with counterparts overseas, look at the risk of heat stress and how this can be reduced.

RESULTS OF A SURVEY OF HEALTHCARE WORKERS WHO WORE PPE FOR EXTENDED PERIODS:

90% suffered excessive sweating

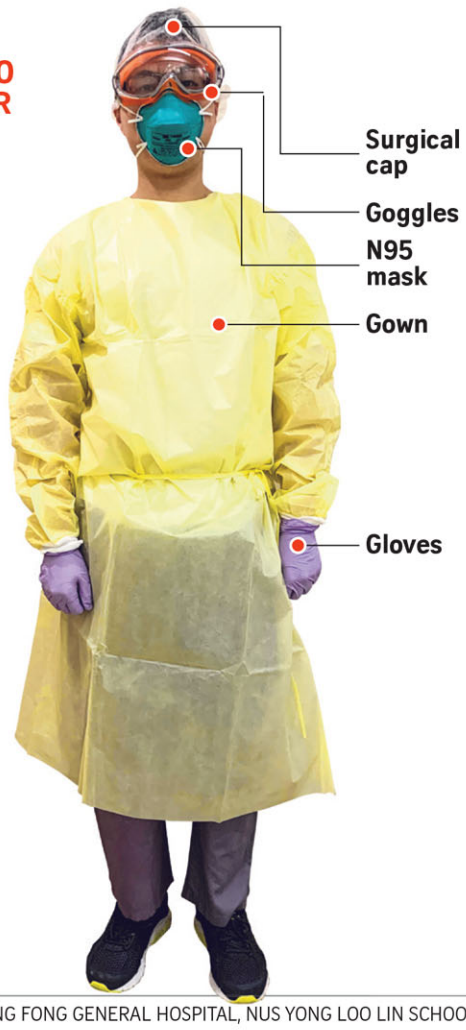
76% felt exhausted

29% felt dizzy

22% got headaches

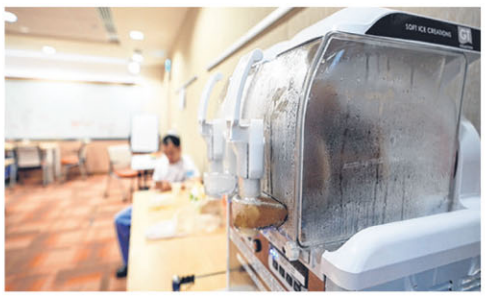
13% had difficulty breathing

PPE COMPONENTS:



PROPOSED SOLUTIONS:

More ice, please
Ice slurry, a cold beverage made by mixing ice with a sports drink, can lessen heat discomfort.

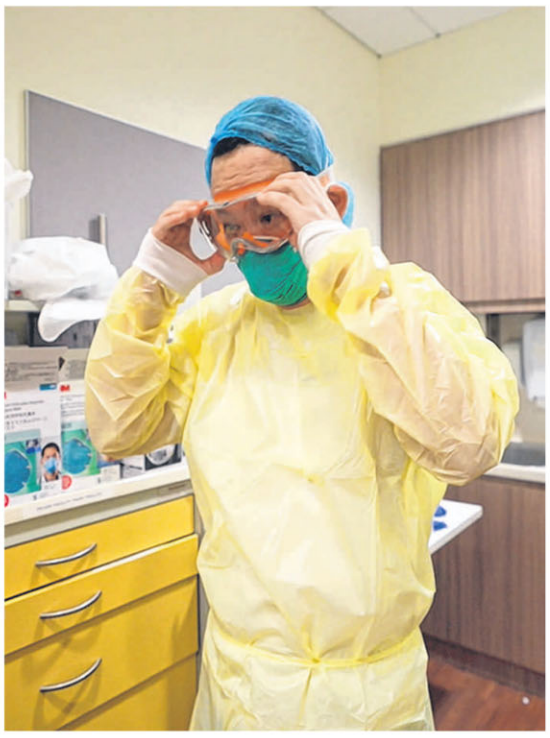


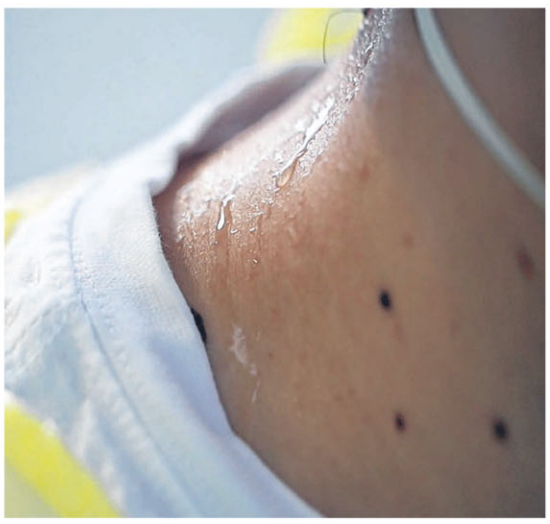
An ice slurry machine in a rest area for healthcare workers at Ng Teng Fong General Hospital.

Keep fit
Aerobic fitness helps to increase heat tolerance.

Ensure enough rest
Some healthcare workers said they avoid taking breaks due to busy schedules, or so that they do not have to change into another set of PPE. But resting allows the body to recover.

Sources: NG TENG FONG GENERAL HOSPITAL, NUS YONG LOO LIN SCHOOL OF MEDICINE PHOTOS: NG TENG FONG GENERAL HOSPITAL
STRAITS TIMES GRAPHICS





Health workers feel exhausted, dizzy from long PPE use: Study

Timothy Goh

A study of healthcare workers in Singapore and India has found that a majority of those who have to wear personal protective equipment (PPE) experience symptoms of thermal strain, including excessive sweating, exhaustion and dizziness.

The Covid-19 pandemic has resulted in more front-line workers having to wear PPE for a prolonged period of time.

In a paper published in the peer-reviewed International Journal of Environmental Research and Public Health on Tuesday, the researchers said that this exacerbates these workers' risk of thermal strain.

The study's senior and corresponding author, Associate Professor Jason Lee of the National University of Singapore's Yong Loo Lin School of Medicine, explained yesterday that thermal strain refers to the amount of heat a person experiences internally.

This is influenced not just by climatic conditions, but also other factors such as a person's fitness and what one is wearing or doing.

Prof Lee, who is from the school's Human Potential Translational Research Programme, told The Straits Times that in a worst-case scenario, thermal strain can result in heat stroke and death.

"Before that, your performance will be compromised... it is not just you (who will be affected), but those whom you care for," he said, noting that if a healthcare worker is experiencing thermal strain, patient care could also be affected.

One of the study's other authors, Dr Jimmy Lee, a consultant at Ng Teng Fong General Hospital's (NTFGH) Emergency Medicine department, said front-line healthcare workers at NTFGH keep their PPE on for seven to eight hours at a time.

Standard PPE includes goggles, a surgical cap, an N95 mask, surgical gloves and a gown. But most of these components are moisture impermeable, which means they also trap sweat.

Prof Lee said: "If sweat doesn't evaporate, it does nothing – you are not losing heat... In PPE, sweat cannot evaporate."

Dr Lee, who wears PPE in the course of his work, said he has seen some medical officers get "soaked" in sweat after just two hours.

Together with a team of other researchers, he and Prof Lee conducted a study of 55 healthcare workers at NTFGH and another 110 from India, who were asked to answer a questionnaire on their knowledge about thermal strain, attitudes towards PPE use and behavioural changes while wearing PPE.

AFFECTS PATIENTS TOO

Before that, your performance will be compromised... it is not just you (who will be affected), but those whom you care for.

ASSOCIATE PROFESSOR JASON LEE, of the NUS Yong Loo Lin School of Medicine, on how thermal strain can impact patient care before badly affecting the wearer.

Some 90 per cent of healthcare workers in Singapore reported sweating excessively in their PPE, while 76 per cent said they felt exhausted.

Also, 29 per cent experienced dizziness as a result of their PPE, 22 per cent got headaches and 13 per cent had difficulty breathing.

Respondents were also given ice slurry – a beverage made by mixing ice with a sports drink – and asked to rate their thermal comfort before and after drinking it. Those who drank it reported that they felt more comfortable afterwards.

The researchers made three recommendations in the light of their findings. First, that ice slurry machines should be provided to healthcare workers to help them lower their body temperature.

Second, there is a need to optimise the work-rest cycle of healthcare workers.

The researchers said that although more research would be needed to prescribe a specific balance, it would be an area worth looking into as this, too, would help manage the effects of thermal strain.

Finally, Prof Lee said aerobic fitness is the most effective way to mitigate the effects of thermal strain, so more emphasis needs to be placed on raising it among healthcare workers.

He said: "We want to make life better for healthcare workers... it shouldn't be (that) during the next pandemic or related event, we go about quantifying another round of healthcare worker thermal stress. That should be part of the preparation package. If we know something is coming and PPE will have to be (put) on, then ice slurries and cooling facilities should be part of the logistics."

Dr Lee added: "In this period, occupational health is very important. We wanted to raise awareness about the importance of (thermal strain). Because we have limited resources and manpower... preserving this resource is important."

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Top: Front-line healthcare workers at Ng Teng Fong General Hospital keep their personal protective equipment (PPE) on for seven to eight hours at a time. Most of the components of the PPE are moisture impermeable, which means they also trap sweat, and this results in some workers sweating excessively (above). PHOTOS: NG TENG FONG GENERAL HOSPITAL