

- Sound—noise

Sleep in pink

Enhancing deep sleep with pink noise may protect the heart, study finds.

The Star Malaysia · 21 Nov 2023 · 7 · By CHRISTELLE PELLISSIER

SLEEP is already known to be essential for maintaining both physical and mental health, and for allowing the brain and body to recover and replenish. Now it seems that sleep could also be beneficial for the heart.



A team of Swiss-based researchers has demonstrated that deep sleep improves heart function, especially when stimulated with pink noise.

Deep sleep, also known as slow-wave sleep, is essential for good health. Not only does it enable physical recovery, but it also helps consolidate information learned during the day, boosts the immune system and reduces stress levels.

So it's hardly surprising that this sleep stage is of great interest to scientists, who are trying to discover whether it can be beneficial to other aspects of health. Now, a team of cardiologists from ETH Zurich and the University of Zurich, Switzerland, has demonstrated that deep sleep can improve heart function when stimulated with certain sounds.

Published in the *European Heart Journal*, the study involved 18 healthy men, aged between 30 and 57, who spent three non-consecutive nights in a sleep laboratory.

The participants were stimulated with sounds – pink noise played when the subject fell into a deep sleep in sequences of 10 seconds at certain frequencies followed by 10 seconds of silence – for two nights.

They were then subjected to no stimulation on the final night. The researchers measured and analysed the participants' brain activity, as well as their blood pressure and cardiac activity. The aim was to determine whether pink noise, considered relaxing, could enhance deep sleep and potentially have an effect on heart rate and blood pressure.

Sounds to protect heart health

“During stimulation, we clearly see an increase in slow waves, as well as a response from the cardiovascular system that is reminiscent of cardiovascular pulsation,” says study lead author, Stephanie Huwiler of ETH Zurich, quoted in a news release.

The findings go on to state that the pink noise, which sounds like static, causes the heart “to contract and relax more vigorously,” in particular the left ventricle, whose role is to distribute oxygen-rich blood to the body’s organs, muscles and tissues. The more vigorous the contraction and relaxation, the greater the blood flow, hence the positive impact on the cardiovascular system.

“We were expecting that stimulation with tones during deep sleep would impact the cardiovascular system. But the fact that this effect was so clearly measurable after just one night of stimulation surprised us,” explains project leader and sleep expert Dr Caroline Lustenberger of ETH Zurich, who also participated in the research.

And the limited number of participants did not diminish the scientists’ enthusiasm. “Despite the relatively small group of subjects, the results are significant. We were also able to reproduce the results on two separate nights, which in statistical terms makes them very strong,” adds Lustenberger.

Improving certain treatments

The researchers point out that laboratory sleep studies are generally based on small groups of individuals. However, they feel it is important to take these findings further, and especially to include women in their future research, notably to take into account gender differences in sleep and cardiovascular health.

Women were not included in the original study group because of the influence of the menstrual cycle or menopause on sleep, which could have skewed the results over such a short study period.

The researchers are excited by these initial discoveries and see many potential long-term benefits. “Especially in preventive medicine, but also in competitive sport, this kind of deep sleep stimulation system might enable improved cardiac function in the future – and possibly ensure faster and better recovery after intense workouts,” says Huwiler.

Lustenberger adds: “The treatment of cardiovascular diseases may be enhanced with this or similar stimulation methods. However, it’s crucial to first investigate whether patients can benefit from this kind of deep sleep stimulation method as well.”

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Stephanie Huwiler