

Paralysed patients communicate thoughts via brain-computer interface

Low social rank bigger health risk than obesity

PARIS, Feb 1, (Agencies): People on the bottom rung of the socioeconomic ladder may live two years less on average than those at the top, according to a large-scale study published Wednesday.

This makes social rank a bigger risk factor for illness and premature death than either high alcohol consumption or obesity, and it nearly equals the risk posed by physical inactivity, researchers said.

On average, a low social rank shaved over 25 months off the average lifespan, compared with six months for heavy alcohol intake and eight months for obesity, according to Lifepath, a European Commission-funded consortium that conducted the study.

For diabetes, the risk was almost four years in lost life, and for smoking nearly five.

The study was the first attempt to weigh the health risk of socioeconomic status against other "modifiable" factors, the authors said, at least in high-income countries. "Low socioeconomic status is one of the

strongest predictors of premature mortality worldwide, but health policymakers often do not consider it a risk factor to target," Lifepath said in a statement.

"Because these circumstances are modifiable, they should be included in the list of risk factors targeted by global health strategies," said Silvia Stringhini of the Lausanne University Hospital, the lead author of the study.

Smoking, drinking and physical inactivity are already the focus of national and global public health policies.

Social rank could be improved by government policies on tax or education, for example, said the study, published in The Lancet.

The researchers reviewed data from 48 previous studies covering more than 1.7 million people from seven countries — Australia, Britain, France, Italy, Portugal, Switzerland and the United States.

They conceded that their research was limited by the fact that they had used the participants' occupation — whether a street

sweeper or a CEO — as the sole measure of socioeconomic status.

Scientists have developed a brain-computer interface that reads the brain's blood oxygen levels and enables communication by deciphering the thoughts of patients who are totally paralysed and unable to talk.

In a trial of the system in four patients with complete locked-in syndrome — incapable of moving even their eyes to communicate — it helped them use their thought waves to respond yes or no to spoken questions.

People who are paralysed except for up and down eye movements and blinking are classified as having locked-in syndrome. If all eye movements are lost, the condition is referred to as complete locked-in syndrome.

Researchers leading this trial said the brain-computer interface (BCI), which is non-invasive, could transform the lives of such patients, allowing them to express feelings and opinion to their loved ones and

carers. Counter to expectations, the researchers said, the patients reported being "happy" despite their condition.

"The striking results overturn my own theory that people with complete locked-in syndrome are not capable of communication," said Niels Birbaumer, a neuroscientist at Switzerland's Wyss Center for Bio and Neuroengineering, who co-led the study.

The trial, published in the journal PLOS Biology on Tuesday, involved four patients with amyotrophic lateral sclerosis (ALS) — a progressive motor neuron disease that destroys the part of the nervous system responsible for movement.

The researchers asked personal questions with known answers, such as: "Your husband's name is Joachim?", and open questions that needed yes or no answers, such as "Are you happy?"

The BCI technique used technologies called near-infrared spectroscopy and electroencephalography (EEG) to measure

blood oxygenation and electrical activity in the brain.

"The machine records the blood flow... and calculates how (it) changes during "yes" and during "no", and the computer develops an idea, a pattern," Birbaumer told Reuters.

"And after a while, we know what the patient is thinking, when he thinks "yes", or when he thinks "no", and from that we calculate the answer."

The "known" questions elicited correct responses seven times out of 10, and the question "Are you happy?" resulted in a consistent yes response from the four people, repeated over weeks of questioning.

John Donoghue, director of the Wyss Center, welcomed the work as "a crucial first step in the challenge to regain movement" for completely locked-in patients.

He said his team now plans to build on these results to develop the technology further and eventually aim for it to be available to people with paralysis resulting from ALS, stroke, or spinal cord injury.

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