

Could poor sleep contribute to symptoms of schizophrenia?

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Neuroscientists studying the link between poor sleep and schizophrenia have found that irregular sleep patterns and desynchronised brain activity during sleep could trigger some of the disease's symptoms. The findings, published in the journal *Neuron*, suggest that these prolonged disturbances might be a cause and not just a consequence of the disorder's debilitating effects.

The possible link between poor sleep and schizophrenia prompted the research team, led by scientists from the University of Bristol, the Lilly Centre for [Cognitive Neuroscience](#) and funded by the Medical Research Council (MRC), to explore the impact of irregular sleep patterns on the brain by recording [electrical brain activity](#) in multiple [brain regions](#) during sleep.

For many people, sleep deprivation can affect mood, concentration and stress levels. In extreme cases, prolonged sleep deprivation can induce hallucinations, memory loss and confusion all of which are also symptoms associated with schizophrenia.

Dr Ullrich Bartsch, one of the study's researchers, said: "Sleep disturbances are well-documented in the disease, though often regarded as side effects and poorly understood in terms of their potential to actually trigger its symptoms."

Using a rat model of the disease, the team's recordings showed desynchronisation of the waves of activity which normally travel from

the front to the back of the brain during deep sleep. In particular the information flow between the hippocampus—involved in [memory formation](#), and the [frontal cortex](#)—involved in decision-making, appeared to be disrupted. The team's findings reported distinct irregular sleep patterns very similar to those observed in [schizophrenia patients](#).

Dr Matt Jones, the lead researcher from the University's School of Physiology and Pharmacology, added: "Decoupling of brain regions involved in memory formation and decision-making during wakefulness are already implicated in schizophrenia, but decoupling during sleep provides a new mechanistic explanation for the cognitive deficits observed in both the animal model and patients: sleep disturbances might be a cause, not just a consequence of schizophrenia. In fact, abnormal sleep patterns may trigger abnormal brain activity in a range of conditions."

Cognitive deficits—reduced short term memory and attention span, are typically resistant to medication in patients. The findings from this study provide new angles for neurocognitive therapy in schizophrenia and related psychiatric diseases.

More information: The study, entitled 'Decoupling of Sleep-Dependent Cortical and Hippocampal Interactions in a Neurodevelopmental Model of Schizophrenia' by Keith G. Phillips, Ullrich Bartsch, Andrew P. McCarthy(1), Dale M. Edgar, Mark D. Tricklebank(1), Keith A. Wafford(1), Matt W. Jones, was published in the journal *Neuron* on 8 November 2012.

www.sciencedirect.com/science/.../ii/S0896627312008513

Provided by University of Bristol

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