

Impaired sleep linked to lower pain tolerance

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Credit: xiaphias/Wikipedia

People with insomnia and other sleep problems have increased sensitivity to pain, reports a study published in *Pain*, the official publication of the International Association for the Study of Pain.

The effect on [pain](#) tolerance appears strongest in people who suffer from both [insomnia](#) and [chronic pain](#), who may benefit from treatments targeting both conditions. The study was led by Børge Sivertsen, PhD, of the Norwegian Institute of Public Health, Bergen.

People with Insomnia Have Increased Pain Sensitivity

The study included more than 10,400 adults from a large, ongoing Norwegian health study. Each subject underwent a standard test of pain sensitivity—the cold pressor test—in which subjects are asked to keep their hand submerged in a [cold water](#) bath.

Subjects were asked about various types of sleep impairment, including insomnia, total sleep time, and sleep latency (time to falling asleep), and

researchers assessed the relationships between measures of sleep impairment and [pain sensitivity](#). The study also looked at other factors potentially affecting sleep impairment and [pain perception](#), including chronic (persistent or recurring) pain and psychological distress (such as depression and anxiety).

Overall, 32 percent of participants were able to keep their hand in the cold water throughout the 106-second test. Participants with insomnia were more likely to take their hand out early: 42 percent did so, compared with 31 percent of those without insomnia.

Pain sensitivity increased with both the frequency and severity of insomnia. For example, compared with individuals who reported no insomnia, rates of reduced [pain tolerance](#) were 52 percent higher for subjects reporting insomnia more than once weekly versus 24 percent for those with insomnia once monthly.

Pain sensitivity was also linked to sleep latency, although not to total sleep time. The relationships were unchanged after adjustment for age and sex. The effect was smaller, but still significant, after further adjustment for [psychological distress](#).

Synergistic Effect of Sleep Problems and Chronic Pain

There was also strong joint (synergistic) effect of insomnia and chronic pain on pain tolerance. Patients reporting high problems with both insomnia and chronic pain were more than twice as likely to have reduced tolerance to pain.

Many patients who experience sleep impairment and pain face high costs and personal difficulties. "While there is clearly a strong relationship between pain and sleep, such that insomnia increases both the likelihood and severity of clinical pain," Dr. Sivertsen and coauthors write, "it is not clear

exactly why this is the case."

The new study is the first to link insomnia and impaired sleep to reduced pain tolerance in a large, general population sample. The results suggest that psychological factors may contribute to the relationship between [sleep problems](#) and pain, but they do not fully explain it. More research is needed to explore the role of neurotransmitters, such as dopamine, that may affect both pain and sleep.

Meanwhile, the study clearly shows the need for efforts to improve sleep among patients with chronic pain and vice versa. Cognitive-behavioral therapy approaches have proved effective for pain problems and insomnia individually. Dr. Sivertsen and colleagues call for studies evaluating earlier interventions targeting patients who are simultaneously affected by both problems.

More information: "Sleep and Pain Sensitivity in Adults." [DOI: 10.1097/j.pain.000000000000131](https://doi.org/10.1097/j.pain.000000000000131)

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