Study models the causes of insomnia in menopausal women

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One of the most common symptoms that women experience during menopause is sleep disruption. Although this change is thought to be associated with depression, hot flashes, and fluctuating hormone levels, few studies have investigated whether they actually influence sleep. In a new study, published in *Journal of Women's Health*, researchers have modeled what factors influence sleep in menopausal women.

The quality of women's sleep declines as they progress into menopause. Concerningly, women who report sleep difficulties also report reduced quality of life and overall health. "Women experience incredible amounts of discomforting symptoms during menopause. It is a concern because the effects can be so debilitating and can last for years," said Megan Mahoney, an associate professor of psychology.

Most researchers have previously hypothesized that changes in reproductive hormone patterns cause poor sleep quality and depression in midlife women. During aging, the decrease in the hormones estradiol and progesterone and increase the levels of follicle-stimulating hormone could cause insomnia. Furthermore, hot flashes can also make it harder for women to fall asleep and stay asleep. However, past studies have not conclusively shown what the underlying causes of sleep deprivation are.

Studies on menopausal women only go back three decades, in part because the symptoms are not lethal. However, researchers now have access to bigger datasets, allowing them to better understand the numerous manifestations of menopause.

The researchers used data from the Midlife Women's Health Study, which was designed to identify which risk factors can cause menopausal symptoms among midlife women. Over 700 women participated in the four-year study.

In the initial clinic visits they completed questionnaires regarding their medical history and they submitted blood and urine samples. For the next three years they returned to the clinic once a year and completed follow-up questionnaires regarding their menstrual cycles, health status, lifestyle, depressive symptoms, and sleep, and submitted blood and urine samples.

The researchers then used a Bayesian network analysis to model the most

likely reason for self-reported insomnia in midlife women. They tested several factors, including hormone concentrations and hot flashes, to see how these may be interacting to influence sleep disruption.

"Surprisingly, we did not find that hormone levels can predict sleep disruption. We did, however, find that women who have hot flashes at night also have insomnia. Moreover, women who had insomnia in the fourth year of the study also had it in the first year. The same was true for depression," Mahoney said. "The bottom line is that some of these symptoms don't necessarily go away over the course of menopause. When women go to the doctor, if they address these problems in the early phase of their menopause, they can address long-term problems."

The researchers would like to understand if there are lifestyle factors, such as high cholesterol, that can predict insomnia in menopausal women . If so, exercise and diet could go a long way to help. They are also interested in learning the extent to which exposure to environmental chemicals leads to sleep disruption.

"Women are continuously exposed to phthalates through their use of personal care products and plastics. We need to examine the associations of these endocrine disruptors and sleep disruptions and insomnia," said Jodi Flaws (EIRH co-leader/MME), a professor of comparative biosciences and co-author on the paper. "Such studies will serve as a foundation for strategies to prevent or treat sleep disruptions and ultimately improve women's health."

More information: Katherine M. Hatcher et al, Nocturnal Hot Flashes, but Not Serum Hormone Concentrations, as a Predictor of Insomnia in Menopausal Women: Results from the Midlife Women's Health Study, *Journal of Women's Health* (2022). DOI: 10.1089/jwh.2021.0502

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