

# **Pandemic alcohol use linked to nervous system disruption in pregnant and postpartum women**

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Increased alcohol use among pregnant and postpartum women during the COVID-19 pandemic was associated with autonomic nervous system

dysregulation, known to negatively affect resilience to change and further exacerbate the risk of stress-related mental health disorders and substance use, a new study published in *Alcohol: Clinical and Experimental Research* suggests.

The findings, although preliminary, underline the potential for a new clinical biomarker and novel personalized mobile health apps in facilitating treatment interventions. Previous research linked the pandemic to increased stress levels and drinking, including in pregnant and postpartum women.

Alcohol use, and stress-related conditions such as depression and anxiety, are associated with dysregulation in the feedback loop between the body and the brain. This process involves the peripheral autonomic nervous system, which regulates the heartbeat. Healthy, resilient people tend to have higher heart rate variability than people with stress and [substance use](#) disorders.

Heart rate variability measures could inform interventions designed to reduce drinking, restore physiologic equilibrium, and improve goal-directed behavior. For the new study, researchers assessed changes in substance use during the pandemic among pregnant and postpartum people and associations between their [real-time](#) substance use and autonomic nervous system imbalances, measured by changes in heart rate variability.

Between 2020 and 2022, investigators worked with 49 pregnant and 22 postpartum women. The participants were interviewed about their pandemic experiences (physical and [mental health](#), and more) and their use of alcohol, cannabis, and tobacco during the previous month, including whether this was higher or lower than usual.

Over 14 days, the participants used a [mobile app](#) on their phones that

nudged them three times daily to record their use of those substances; this generated 2,610 reports. Their heart rates were tracked in real-time via wearable electronic fitness devices. The researchers used [statistical analysis](#) to look for changes in the women's substance use and associations between those and their heart rate variability. Using baseline surveys and real-time self-reports allowed the researchers to track individual and group changes.

Almost three in four participants reported that the pandemic had worsened their stress level or mental health. In the previous month and the 14-day study period, more than one in five reported drinking, 17% reported cannabis use, and 8.5% reported nicotine use. Alcohol was the substance most commonly consumed "more than usual." In individuals who reported any [alcohol use](#)—primarily postpartum women—the heart rate data indicated substantial autonomic changes. This included decreased parasympathetic activity, which regulates the resting state; the effect persisted after accounting for maternal age and pregnancy status. Decreased parasympathetic activity has been linked to stress disorders, such as anxiety and PTSD, and substance use disorder. The study results also implicated alcohol use (not nicotine or cannabis) in increased sympathetic nervous system activity associated with stress and fight-or-flight responses.

The findings highlight the negative effect of the COVID-19 pandemic on the psychological health of pregnant and postpartum women. This was associated with higher substance use and, in turn, autonomic nervous system dysregulation, putting some women at risk of developing substance use disorder. The study identifies [heart rate variability](#) as a promising noninvasive measure of physical and [psychological health](#) and the feasibility of using mobile health technology with pregnant and postpartum women; both can contribute to developing just-in-time therapeutic interventions. Drinking during pregnancy and the postpartum period, and prenatal cannabis exposure, are linked to negative

developmental consequences in offspring, underlining the necessity of universal screening for substance use in pregnant and [postpartum women](#)

**More information:** Sharon Ruyak et al, The effect of the COVID-19 pandemic on substance use patterns and physiological dysregulation in pregnant and postpartum women, *Alcohol: Clinical and Experimental Research* (2023). [DOI: 10.1111/acer.15077](https://doi.org/10.1111/acer.15077)

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