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Yeah, Seasonal Affective Disorder is Real

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Welcome to Issue 64 of Science Says! Our weekly newsletter where you'll learn the latest healthy aging and C15:0 research news that our team of doctors, scientists, and experts are most excited about—without having to go search for it.

Eric and Steph
Co-Founders, Doctors, Nerds

What Dr. Stephanie Venn-Watson, our co-founder and author of over 80 peer-reviewed scientific publications, is reading.

HEALTHY AGING

Keeping darker days from being, well, so dang dark

As days start getting shorter and nights longer, 1 in 10 of us will start experiencing the symptoms of Seasonal Affective Disorder (oh so appropriately called, SAD). This week, we're covering the symptoms of seasonal affective disorder, the most recent science on what causes it, and most importantly - what we can do about it.

I'm pretty sure I have Seasonal Affective Disorder. But what is it, again?

Seasonal affective disorder (aka, SAD) is a condition that arises in fall and progresses through winter. Come spring and summer, seasonal affective disorder disappears. As described by Rosenthal et al., this condition often includes the following:

- ☑ Over sleeping, but with less slow-wave sleep
- ☑ Over eating, with extra carbohydrate cravings
- ☑ Prominent fatigue (yawn, being super tired)
- ☑ Episodes of sadness or depression

If you just checked off several items on this list, you're not alone. In his review, Magnusson showed that most adults experience some amount of these changes during winter, and this is called "subsyndromal SAD".

What causes SAD?

As with anything that affects our mood and behavior, there is no single thing that causes this winter gloominess. That said, R.D. Levitan shares the following top contributors to SAD:

- An out-of-whack circadian rhythm, which is our biological clock that responds to changes in light and dark
- Imbalanced melatonin, a hormone our brain makes based on light-dark cycles
- Low levels of monoamine neurotransmitters, including serotonin, norepinephrine, and dopamine

Based on how much each of these components plays a role in an individual can help guide which treatments may work best. But, if we had to cut to the chase (which is likely why you read *Science Says!*), the common link is... light. Specifically, the need for good ol' fashioned daylight.

Sorry, Northerners. Evolution has been too darn slow...

The more sunshine you get, the less likely you are to have severe seasonal affective disorder. Numerous studies, including those reviewed by Magnusson, have shown that the further north one lives, the higher the prevalence of SAD.

Levitan explains that, since homo sapiens (fancy name for, us) primarily originated at the equator, our ancestors did not have to deal with major shifts in the amount of daylight they received throughout the year. As we expanded to living away from the equator, we did not evolve quickly enough to effectively adapt to big changes in daylight doses. Enter, SAD.

...or maybe you're just better survivors.

Another explanation for SAD provided by Levitan, is called the "seasonal thrifty phenotype". Here, it is proposed that we crave carbs, gain weight, and sleep more in the winter to increase our likelihood of survival in the dark, snowy months. Yeah, like hibernation and bears. Except with macaroni and cheese and episode binge-watching.

Some solutions? Walk in the sun while talking to friends.

In their review, Jupe et al. cover the latest scientific support for various treatments of SAD. This includes the following:

- Maximizing your daylight exposure
- Regular exercise
- Managing stress
- Light therapy (light boxes that simulate sunlight exposure)
- Talking therapies
- Selective serotonin reuptake inhibitors

Here, Jupe et al. conclude that, as well as getting benefits from any or all of the above, light therapy effectively improves symptoms of SAD within a week. Before searching for "light boxes", however, work with your physician to understand what may work best for you... and which light therapies provide true hope vs. hype.

Of *course* there's a link to C15:0.

While much of the science on pure C15:0 focuses on its benefits to long-term metabolic, heart, liver, and immune health, there have been some recent studies relevant to balancing seasonal changes in mood.

- **Cell-based activities of C15:0 mimic mood enhancers.** Venn-Watson et al. (wait, that's us!) showed that the cell-based phenotypic profile of C15:0 closely matches that of compounds known to positively impact mood.
- **A key C15:0 metabolite mimics serotonin.** In a separate study, Venn-Watson et al. also showed that pentadecanoylcarnitine (aka PDC) mimics serotonin, a mood lifter. Our bodies use C15:0 (aka pentadecanoic acid) to make PDC.
- **People with higher C15:0 levels are happier.** Consistent with the studies above, Brydges et al. showed that people with higher concentrations of circulating C15:0 were less likely to have components of major depression.

Okay, now that you've got your *Science Says!* fix for the week, go fetch a good dose of daylight. Have a great week, everyone!

Dive deeper into the science

READ THESE STUDIES

- Rosenthal et al. Seasonal affective disorder: A description of the syndrome
- A. Magnusson An overview of epidemiological studies on seasonal affective disorder.
- R.D. Levitan The chronobiology and neurobiology of winter seasonal affective disorder
- Levitan et al. A seasonal thrifty phenotype hypothesis
- Jupe et al. Treatment of seasonal affective disorder. The efficacy of light therapy
- Venn-Watson et al. C15:0 has a cell-based profile that mimics mood enhancers
- Venn-Watson et al. Pentadecanoylcarnitine has activities that support mental health
- Brydges et al. Metabolomic signatures in symptom dimensions in major depression
- Check out all the C15:0 science at discoverC15.com