Sleeping Teens

Recent studies by Cousins Center researcher Andrew Fuligni, Professor of Psychiatry and Biobehavioral Sciences and director of the Adolescent Development Lab at UCLA, are helping to paint a comprehensive picture of the role of sleep in the biological, psychological, and behavioral development of adolescents.

Fuligni’s research focuses on how social and sociocultural experiences shape different aspects of development. “Right now, we’re also spending a lot of time looking at issues of stress and sleep. Within the everyday life of adolescents, sleep is affected by stress and by a variety of things going on in the teens’ families and in their own lives. In turn, sleep can shape other aspects of their psychological, educational, or physical development,” he says.

In a recent paper in the journal Psychosomatic Medicine, Fuligni and colleagues looked specifically at how teens’ sleep patterns are related to levels of a particular protein in the blood called C-reactive protein, or CRP. CRP levels rise in response to inflammation, which could place adolescents at risk for diabetes as well as cardiovascular disease as adults.

The study, published in the Journal of Clinical Oncology, involved 90 breast cancer survivors, aged 42 to 83, who reported having trouble sleeping three or more nights per week and felt depressed and fatigued during the day. The participants were randomly assigned to weekly CBT-I sessions or tai chi instruction. They were evaluated periodically for the next year for sleep problems, fatigue levels, and depression, and then again at 15 months. In both groups, nearly half of the subjects showed robust and enduring improvements in their insomnia symptoms.

The study involved 315 teens from diverse ethnic backgrounds, ranging from 14 to 18 years old. For eight consecutive nights, the subjects wore watches that detected their movements. Sleep was then inferred based on the adolescents’ movements, as well as their reports of when they shut off the lights to go to sleep at night; the times when they got out of bed in the middle of the night; and when they arose in the morning. Blood samples were obtained from each subject through finger pricks.

In teens of all ages, larger shifts in the number of hours spent sleeping, or variability in sleep duration (for example, if you sleep eight hours one night, six the next, and eleven the following night), were linked with higher levels of CRP. “This variability finding is particularly interesting,” Fuligni says. “It’s not just how much you sleep on average but the extent to which you’re shifting around your body clock and your sleep patterns on a day-to-day basis.”

The researchers also found that lower average sleep duration was associated with elevated CRP, but only in younger adolescents. “We’re not exactly sure what’s happening...
Stress Speak

A new Cousins Center study suggests that our unconscious verbal tics can provide unique insight into the physical toll of stress on our bodies. For the study, appearing in the journal the Proceedings of the National Academy of Sciences, 143 adult volunteers wore audio recorders that switched on and off every few minutes for a period of 48 hours, capturing audio clips of the subjects’ daily interactions; nearly 23,000 clips were collected in all. Following the two days of recordings, each volunteer gave a blood sample that was analyzed for the expression of a set of 50 genes in white blood cells that are known to be influenced by adverse life circumstances such as low socioeconomic status, social isolation, diagnosis with a life-threatening illness, and posttraumatic stress.

In analyzing the volunteers’ language, the researchers, led by Steve Cole, Professor of Psychiatry and Biobehavioral Sciences and Director of the UCLA Social Genomics Core Laboratory, were particularly interested in the use of so-called “function words,” such as pronouns, articles, and adverbs. Because function words are used relatively automatically, Cole and his colleagues suspected that they might provide insight into a speaker’s state of mind. Analysis of the recordings revealed that subjects whose gene-expression patterns indicated high stress more frequently used adverbs such as “really” and “incredibly,” which can function as “intensifiers,” than did less-stressed individuals. These highly stressed individuals also used fewer third-person pronouns like “they” or “their,” suggesting more focus on themselves than on others. Such speech patterns were better predictors of disease-related molecular profiles in the body than the volunteers’ own reports of stress, anxiety, or depression. The findings, Cole and his co-authors say, suggest that doctors assessing stress should listen to not just to what their patients say—but how they say it.

It is generally accepted that depression is common in cancer patients—indeed, according to one review, approximately one-sixth of cancer patients have a diagnosis of depression in the first five years after their cancer is detected. When depression occurs, notes Cousins Center research scientist Julienne Bower, “it is associated with poor neurobiological markers that could signal a patient’s increased likelihood of becoming depressed—even before any symptoms appear.

In particular, the pathways linking depression with inflammation, as well as other behavioral symptoms that are common in cancer patients and survivors, are of keen interest to Bower, a Professor of Psychology and Psychiatry and Biobehavioral Sciences at UCLA. Although psychosocial factors including the stress of a cancer diagnosis have long been associated with an increased risk of depression in cancer patients and survivors, Bower’s lab is also looking for potential neurobiological markers that could help identify women with breast cancer who would benefit from psychosocial interventions to prevent depression.

More broadly, she and her colleagues are involved in intervention studies that target inflammation and depression. One such study, the Pathways to Wellness project, is assessing the usefulness of different behavioral interventions, including survivorship education and mindfulness meditation (a practice that teaches individuals to pay attention to, but not react to, their moment-by-moment thoughts, emotions, and physiological responses and sensations), in younger breast cancer survivors, to determine how well the practices can help reduce stress and improve quality of life.

Among healthy individuals, the amount of cortisol present in saliva samples shows predictable daily variation, with a high concentration of cortisol present right after waking followed by an immediate increase within 30 to 40 minutes, known as the cortisol awakening response (CAR), and then a steady decline during the day.

The study, appearing in the journal Psychomatic Medicine, found that women with early-stage breast cancer who had a larger CAR at a baseline assessment (usually occurring after tumor surgery but before treatments such as chemotherapy and radiation) had more depressive symptoms six months after their treatment ended.

“This study suggests that an elevated CAR may be a risk factor for elevated depression in the aftermath of breast cancer diagnosis and treatment, and potentially a mechanism,” says Bower, who notes that evaluating CAR might help identify women with breast cancer who would benefit from psychosocial interventions to prevent depression.

Evaluating the Link between Inflammation and Depression in Breast Cancer Patients

In one recent study, she and her colleagues examined the functioning of the hypothalamic-pituitary-adrenal (HPA) axis in women with early-stage breast cancer. The HPA axis, which is known to be altered in individuals with depression, is a component of the body’s physiological stress response system that, for example, controls the release of the stress hormone cortisol.

The researchers examined the functioning of the HPA axis in 32 women with breast cancer and 32 healthy controls. They found that women with breast cancer had lower cortisol levels than healthy controls, suggesting that the HPA axis was less responsive to stress.

The findings suggest that depression in breast cancer patients may be a result of an altered HPA axis, which could explain why women with breast cancer are more likely to develop depression than healthy controls. The results also highlight the importance of assessing the HPA axis in breast cancer patients to identify those at risk for depression and develop targeted interventions to prevent its development.