

Interview with Dr. Katherine Sharkey

Chinmayi Balusu

I had the honor of interviewing Dr. Katherine Sharkey, MD, Ph.D., Associate Professor of Medicine and Psychiatry & Human Behavior at the Alpert Medical School of Brown University and Assistant Dean for Women in Medicine and Science. Dr. Sharkey also serves as the Associate Director of the Sleep for Science Research Laboratory. Her research focuses on sleep and circadian rhythms, especially as they relate to mood regulation and women's health. In this interview, Dr. Sharkey talks about her research, her path to researching sleep and circadian rhythms, and the importance of sleep medicine.

According to the National Sleep Foundation, a circadian rhythm is “a 24-hour internal clock that is running in the background of your brain and cycles between sleepiness and alertness at regular intervals.” Circadian rhythms, also known as the sleep/wake cycle, are controlled by the suprachiasmatic nucleus of the hypothalamus, and light and dark greatly affect them. Circadian rhythms function the best when people have regular sleep habits, but in times such as pregnancy and the postpartum period, they can change. Studying pregnancy and the postpartum period is an interesting model for Dr. Sharkey's research, which focuses on mood regulation and sleep, because circadian rhythms can drastically change, naturally.

One study that Dr. Sharkey conducted “enrolled women and followed their sleep from pregnancy to postpartum. One of the things [they] looked at was [the women's] circadian rhythms, and they found that the circadian rhythms did not stay stable.”

Dr. Katherine Sharkey: “If I measured your circadian rhythm at a normal time, melatonin levels increase during the night and lower during the morning. If you and I were to be studied now, tonight, and three weeks from now, the circadian rhythm would be stable because most of the time people are in a regular habitat. In the pregnancy and postpartum period, there are big changes across that time period, suggesting that circadian rhythms don't stay stable because of this massive life change people have when they have a baby. And, it's partly because of how that life change affects sleep. The most important thing for keeping our circadian rhythm in sync is the light-dark cycle. Imagine you're a pregnant lady getting up five times a night or you're a postpartum lady with a baby and you turn the lights on in the middle of the night to go and feed the baby. [The women are being exposed to light in the middle of a usual dark period.]”

“The light-dark cycle was getting so messed up because women were getting up so much at night and also getting sleep during the day. And, one of the common things that

people say in western society is ‘sleep when the baby sleeps,’ which isn’t the greatest advice because a lot of times women can’t sleep in the middle of the day when the baby is sleeping because their circadian clock is programming them to sleep at night and stay awake during the day. This can be a very frustrating experience.”

“In our research, we found, when looking at the magnitude of light exposure, that pregnant women got more light during the day than postpartum women. Light levels in the morning or evening were lower during the postpartum period than they were during pregnancy. In the postpartum period, there wasn’t a robust difference between daytime and nighttime; overall, the amplitude from the lowest amount to the highest amount was decreased in the postpartum period.”

Dr. Sharkey’s current work involves taking “women who are experiencing depression and anxiety during the postpartum period and treating them with light.”

Dr. Sharkey: “With manipulation of their sleep schedule, we can stabilize those circadian rhythms as much as possible during the postpartum. We are measuring the women’s circadian rhythms throughout the course of the study and track their mood.”

As Dr. Sharkey says, “people care about postpartum depression. It affects a lot of women, and if the mother doesn’t feel well then things may not be so great for the baby.”

Dr. Sharkey currently conducts research for about a third of her time, where she sees people that are in the study and writes reports about the data that they’ve collected. Another third of the time, she sees patients. Dr. Sharkey is “boarded in internal medicine, sleep medicine, and psychiatry but [she] practices sleep medicine exclusively, [and she sees] patients two half-days a week.” The other third of her time, Dr. Sharkey serves as the Assistant Dean for Women in Medicine and Science, where she “fosters professional development for women in the department of biomedicine or the division of biomedicine at the medical school.”

Dr. Sharkey also spoke about her background. She majored in psychology at the University of Pennsylvania’s College of Arts and Sciences and completed her pre-med requirements. Dr. Sharkey began working in a sleep lab after college. At that point, she was interested in mood research but didn’t know about circadian rhythms, but she was able to work with a mentor named Mary Carskadon. It was there, that she realized that sleep was “an interesting lens to look at circadian rhythms.” After working at the sleep lab for three years, Dr. Sharkey entered an MD/Ph.D. program at Rush University in Chicago. After the first two years of medical school, she studied melatonin in shift work

during the four years of her neuroscience Ph.D. She did a “randomized control trial where [she] studied how melatonin can help night-shift workers adapt their circadian rhythms.” There, she learned “techniques about studying sleep and circadian rhythms that [she] didn’t know before.” After finishing medical school, she completed a residency in internal medicine and psychiatry, where she looked at the “mind-body” connection.

Chinmayi Balusu: “Have you faced any obstacles in your research?”

Dr. Sharkey: “One was when we did a study where we tested the breast milk of women with narcolepsy. People with narcolepsy have the intrusion of sleep into wakefulness, and they can have hallucinations or paralysis. The medications for narcolepsy are very helpful, but if you are pregnant, should you breastfeed a baby while taking those medications? We don’t know. In the study, we tested the breast milk of women who had narcolepsy and were taking medication. When we submitted the paper to a journal, it was rejected because there was too small a sample size. But how many ladies with narcolepsy who are breastfeeding can you find? So there’s difficulty in finding participants for studies, and papers are often rejected from journals or people criticize the research because there’s too small a sample size or because it seems like the conclusions are going beyond the results.”

Dr. Sharkey also spoke about the importance of circadian rhythms and sleep research:

Dr. Sharkey: “I believe that circadian rhythms are what help us regulate and organize all of our behaviors and all of our physiology to live on this planet. It’s one of the major adaptations for living on this planet. [...] The sleep and circadian fields are pretty new! And, compared to other fields, the brain is a much newer frontier. We call it sleep medicine but a lot of times it’s also wake medicine. It’s not just what happens at night but also to what extent that translates into what you do in the day and how you perform your best. [...] There’s less known about what makes a normal circadian rhythm and what it’s important for. It’s pretty complicated to measure circadian rhythms, which is why we don’t measure it clinically very often, which is why I think there is a gap. When I talk about the pregnant women I’m studying, the women have to collect twelve samples of their saliva across the night and they have to wear dark glasses while doing it because melatonin is suppressed by bright light. It’s pretty complicated.”

Chinmayi: “Do you have any advice for students who are interested in neuroscience and psychology?”

Dr. Sharkey: “If you want to do science, the brain is a great thing to study. With science, it has to be something that interests you! It’s important to be a good writer and communicator and learn how to work well in diverse teams; science is now about

networks of people. It's important to have leadership skills, learn to read scientific papers critically, and be able to translate scientific work to the public. We have solved the easy parts of science. What's coming up next are the hard parts."