

Project Sleep Podcast
“Your Environment & Sleep Disparities with Dr. Dayna Johnson”
(Sleep Insights Series Episode 3)

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Dr. Dayna Johnson, PhD, is an Assistant Professor of Epidemiology at Rollins School of Public Health at Emory University in Atlanta, Georgia. Dr. Johnson’s research has uncovered much about the social contributors to racial and gender disparities in sleep by assessing the effects of social, household-level and neighborhood-level factors in correlation with insufficient sleep.

The Sleep Insight Series invites listeners to learn about this amazing adventure we take every night called sleep. Through these insightful discussions, we examine sleep, and our societies beliefs about sleep, from a variety of angles. We hope you'll learn some cool new facts and analogies that you can use to help us raise awareness about this under-appreciated one third of our lives. This is a written transcription of the podcast “Your Environment & Sleep Disparities with Dr. Dayna Johnson” (Sleep Insights Series Episode 3) from Project Sleep. Transcription provided by Mirela Starlight.

Project Sleep is a 501(c)3 Nonprofit Organization, dedicated to raising awareness and advocating for sleep health, sleep equity and sleep disorders.

All guests and speakers express their own opinions. While medical diagnoses and treatment options are discussed for educational purposes, this information should not be taken as medical advice. Each person’s experience is so unique, which is why it’s so important to always consult your own medical team when making decisions about your own health.

Julie in intro: In today's podcast, Dr. Dayna Johnson shares a story about her own grandmother, who lived in an unsafe environment for a while, and every night her grandmother would sleep with her purse and all the lights on so that people knew someone was home, and if she had to leave quickly she could. This story has stuck with me as the incredible ways that we don't always think about how our safety impacts our sleep. So, when talking about creating a healthy sleep environment, we often assume that things like light, temperature, safety, and our sleep schedules are all within our personal control. Today, Dr. Dayna Johnson talks about important and under-discussed factors influencing people's ability to get a good night's sleep. And how policies can shape our individual behaviors, our sleep, and our overall health.

Julie: Hello everybody! I'm so excited for you all to meet our expert, Dr. Johnson. Dr. Johnson is an assistant professor at Emory’s Rollins School of Public Health and her research is aimed at understanding the root causes of sleep health disparities and their impact on cardiovascular disease by addressing the social environmental and environmental determinants of sleep disorders and insufficient sleep. So, Dr. Johnson, we're really excited to hear what you have to share with us about some of the social impacts on our sleep.

Dr. Johnson: Yeah, so thank you for having me. I'm really, really happy to be here. So, in this arena of sleep disparities, I think about people who live in environments that are altered in some

way. And so thinking about— inopportune light exposure and how that affects their sleep. So my work really identifies aspects of our household and neighborhood environment, that may alter our sleep— and then thinking about the people who are forced to live in those environments because of social factors such as segregation— residential segregation, for example. And so one of the pieces of my work is really getting my colleagues and clinicians to think about how people are nested within environment. And so what do I mean by that. So you take an individual, they are nested within social relationships, right? Friends, families, so on. And then they're nested within a home. So you live in a house, or apartment, or some type of dwelling. And then that is nested within a neighborhood environment. And then that environment has different exposures. And I'll talk a little bit about that. And then that is nested within certain institutions, and within certain policies. So when we are giving suggestions to a person, we're usually thinking about that individual behavior— you know, are they able— telling them, for example, sleep during the night or sleep in a dark environment. Well, we're not thinking about the types of environments they may live in— is a safe for them to be in a dark environment. You know, are they living somewhere where they have control over the light? Are they living somewhere where they have control over— temperature, for example?

Dr. Johnson: So in one of the studies that I have done in Boston, we found that people that lived in places like public housing, may not have control over their temperature. And in the health-behavior realm and thinking about sleep hygiene or healthy sleep practices, you know we talk about sleeping in an environment that's a comfortable temperature. So again, that suggests that you have some level of control over— having your temperature set in a certain way. And if you live in a public housing, this may not be the case. And so taking this work and being able to translate it into policy and working with both, people that are living in these types of housing— dwellings, as well as those that control the policies around these. So that's one point of thinking about how we're nested and so if I'm prescribing something to you, I need to think about— can that actually work, and if not, I need to expand that— in order to address these other social conditions, you know, whether that's safety, for example.

Dr. Johnson: And so when I think about the environment, I think about several settings. And so, to start at the larger one that we think about, it's like the neighborhood environment, and I call those contextual factors. And so I mentioned that we live in these environments that were intentionally designed in this way. So the patterning of environment are the results of race, ethnicity, socio-economic status, immigration status— so you can see the segregation of these environments based on historical law. So things that happen like redlining, when people are forced to live in certain areas because they were denied mortgages in more affluent areas because of their race, for example. And so this has translated over generation, and so we still see the segregation in these areas and the reason why this is important— areas that racial minorities are more likely to live, as well as those of lower socioeconomic status, so those of lower income, these are areas that tend to have more air pollution. So there are areas where there are more manufacturing plants, that are potentially— are maybe, emitting certain pollutants into the environment and we know that affects our breathing. So and thinking about sleep apnea, for example, is a large part of my work— and so we know that the air can affect that, so that's an obstruction in our airway, right. And so, um— so in my work, I look at things like income, and where someone may live, and how that creates— exposes them to certain exposures that may increase their risk for sleep apnea. So in addition to thinking about the air, we also have to think about the other pathway to sleep apnea which is obesity. So if you live in an area that, uh— a food desert, and there's no opportunity, or limited opportunity for fresh fruits and vegetables, you tend to eat more fast food. So again, your environment is shaping, you know, these behaviors. And then you may be in an environment where it's not safe to walk, or

there's a lack of sidewalks— you might think about some rural areas, for example. So whether you're in an urban or rural environment there can be different exposures that may affect your ability to engage in physical activity and healthy eating— that could prevent obesity, and then that's another pathway that might lead to sleep apnea.

Dr. Johnson: And then the other piece that I think about, for the prior contextual factor and thinking about policies, are things like minimum wage. And so many times people will, you know, look at me and say, why are you concerned about minimum wage, as a sleep person? I'm concerned about it because that's going to affect whether or not you have multiple jobs— and multiple jobs may translate to you working more. Right? So you might have a day job and a night job— and so that can translate into a shorter sleep period or it can also affect implementing a consistent bedtime, with children for example, if you're a parent. And we know that consistent bedtimes are important for healthy sleep practices for children. So I'm thinking about this at all these different levels. How our policies, again, can shape our individual behaviors. And so, when I give talks I usually show pictures of different environments and thinking about whether you're in an area that has a heavy police presence— there's a lot of violence or a lot of crime. That is going to affect whether or not you are able to comfortably sleep. And I often tell this story of my grandmother, she passed many years ago, but she for a long period of time lived in an environment that was not safe. So she would sleep with her purse and all lights on because she wanted to make sure people knew someone was in the home or if she needed to leave, you know, quickly, she was able to.

Dr. Johnson: Now how could you comfortably sleep an environment like that, right? And so, also in these environments they have brighter lights which are intentionally designed in order to deter crime from occurring. So yes, that's great. We want to stop crime, so we put brighter lights in. But then what does that do for our sleep? So you have these bright lights that are outside of someone's apartment, shining in, and it's going to interrupt their sleep cycle, right? And so we might have to think about, you know, whether they are a lark or an owl, and how much that may affect. But there are things that we can do to prevent that. There's shields that you can put on the light to make sure it's shining in a certain area and not into people's homes. So there's many things that we can do around that. So that's at the neighborhood level. And then if we think about, like our work environment, and this was also mentioned. And so what was mentioned is— and thinking about people who are— or the goal, as mentioned is for people to be able to sleep without an alarm clock. And that comes with privilege. And so, I— you know, and honestly I have that privilege, right. I can set my meeting schedules, where I can wake when I feel ready— but what about the person who can't? And that's what we have to move towards is— changing these policies that allow people to be able to have flexible sleep schedules— or flexible work schedules, excuse me— that allows them to be able to sleep according to their circadian rhythms.

Dr. Johnson: And then the other piece about that, is thinking about those who engage in shift work, or night shifts— how that affects their sleep, we know people that shift work can have worse sleep and also worse health outcomes. And then, thinking about the stress of a job, right? Whether it's work demands, or interpersonal stressors, or conflict, or— there's another concept that I study as well, it's goal striving stress. And this is a type of stress that tends to be unique to racial minorities of higher socio-economic status, where they are really pushing and working harder— to really prove that they should be in a certain work environment, which is the result of racism and other things that can happen. And then it's also, we have to think about how much autonomy someone has over their job, and— whether or not we can mitigate these things with like, social support. Which we can affect. So that can affect our sleep, as well as, depending on

which of those aspects, it can affect, or lead to circadian misalignment and that can affect our performance.

Dr. Johnson: And so, and just going back to the house— the housing environment, there are many things that we can do. And so, I learned just from talking to people in my studies, where they were saying, I watch television at night and I was suggesting you know not to sleep with their television going, but again, going back to safety, this was their way of promoting some noise in their environment— again, to make sure people know that someone's in the home, and so that's also emitting some level of light. And so we have to think about how we can— we can alter that, but there are ways. Both at different levels, individual— as well as household as well as policy level. And then thinking about the types and then— the way that our homes are built, and working with urban planners, working with architects, to intentionally design our homes that have proper insulation, proper ventilation. All these things to improve our surroundings that make it more promoting to a healthy sleep environment. There are certain windows we can put in, right, to reduce noise and other factors. And then the use of shade, and also thinking about whether or not someone has a home— that's the other piece that's important to think about, so if someone is homeless and they're living in a shelter, what is that like? How can we— you know, work to create environments, or— really decrease homelessness, right— in order to move people into homes, and so there's— some emerging research, there's not a lot in the area— but we have seen that people that move from different shelters, that are homeless, we see a reduction in their insomnia symptoms overtime. And again, insomnia's this condition in which there's a problem initiating or maintaining sleep. And so we can see— we have evidence that shows, when someone moves from a shelter into a more permanent housing, we see a reduction in their sleep problems, particularly insomnia. Thinking about these different factors that affect our sleep at these different levels and how we must consider them in trying to improve sleep for all people.

Julie: Thank you so much. I just am a huge fan of your work, I remember one of the first articles I ever read that made me think about even founding Project Sleep— I think it was called "Sleep As a Negotiated Process" or something like that—

Dr. Johnson: Hmm!

Julie: —about sleep and social relationships, and that what opened my eyes to like— just because I'm more of a communications person, and more, you know, the social dynamics, than, um— a science person, and the science was so fascinating too, but I just, I— thank you for sharing about some of this. And I think one of the words that I saw in an article that was a workshop article that I think you were part of, but it was a workshop at NIH, perhaps— and they used the word "vulnerability"—

Dr. Johnson: Yes.

Julie: —that sleep is a vulnerable process— and I never thought of it like that. It's just so true, when you talk about safety, and— homelessness, and whether someone feels safe to fall asleep— that vulnerability. It's something I don't think we really talk about, at all, so.

Dr. Johnson: Right, and think— consider things like interpersonal violence, right. If someone is in an abusive relationship. So that effects so many aspects, but since we're talking about sleep

here— you know, how safe are you within your home. So thinking about that at these different levels, your home and your neighborhood environment.

Julie: Well, you're amazing! Thank you! (laughs) Um, for—

Dr. Johnson: Thank you.

Julie: — working away, on all of this. I guess thinking about sleep in the transitions, and the time— that not just thinking of sleep as being awake, or— you know, being asleep, if there's—

Dr. Johnson: You know, it's definitely important to think about how connected sleep and wake truly are. So during wake, you know, we're building up our drive for sleep and during sleep, we're really building up our ability to be able to perform during the day. But, the additional piece that I want to add is in thinking about, as we are transitioning through our sleep period— we're going through different stages, right, that are extremely important for our health and our wellbeing. But in thinking about how that connects to our wake, so one function for example, is our learning and memory. And I especially like to talk about this with young folks, especially as a professor. And I encourage my students, "Never do an all nighter!" Like, it's never going to work, you're never going to remember— you know, anything. (laughs) You know and thinking about, what— that during the sleep period there are important physiologic activities that must occur— must occur— in order for us to be able to function appropriately during that wake period. And so, in just knowing that sleep is actually very active, you know, some people think about it as, oh you know, you're just asleep, it's no big deal. But there's actually really important— it is a big deal. There's so many important things happening. And so, in just thinking about that— in terms of those activities, and how that relates bi-directionally with wake.

Julie: So when we think about like, systemic change, I guess I'd love to hear— oh gosh, there's so many— there's so much change that should be made, but if you had to choose one, as far as like a systemic change, on a policy level, perhaps— what one would you choose?

Dr. Johnson: So I started off by saying my work was in the area of sleep disparities, right. So, with of course the discrimination. So many of our policies, so this is more of an upstream factor— that shapes our policy. So if we can eliminate discriminatory practices, we could move towards equity, which would spill over to improving sleep, improving health, improving access. You know, all of these downstream things, down to the individual, could change if we can address discrimination that happens— and I'm talking by— socio-economic status, race, gender, sexual preference, all of these factors happen and— discrimination happens at the policy level that affects individuals. So if we can address that, I think that will spill over into us living in a more equitable world. Until— and that will spill over into policy. I talked about livable wages— you know, that's discrimination by socio-economic status, right? And so if we can— we can address that, we can really improve health, and— and many, many factors. So addressing these root causes of health disparities.

Julie: Wow. Thank you for what you're doing.

Dr. Johnson: Before we go, one of the reasons why it's so important to me, so I'm in the field of public health, I'm an epidemiologist. And I remember having this thought when I was a master's student, and thinking all the work that we do, are just for people like us to read. So other

scientists, you know, read our articles and so on. So it's really important for me to do things and share and be able to translate the work that we're doing, in terms of research, to disseminate it to the communities that are truly affected. The individuals that need this work. And so, I love to do outreach work— and make sure that what we're doing is actually benefiting people, and not just, you know, publishing it in a paper which is important— but you know, making sure that gets disseminated.

Julie: Well, thank you, and— you might've signed yourself up for more, I don't know. (laughing)

(Dr. Johnson laughing)

Julie: Thank you again for taking the time, and— thanks everyone for tuning in!

This discussion was originally recorded during Project Sleep's [Sleep Advocacy Forum](#) in October 2021.