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The UMB Pulse Podcast

Adolescents: Why Sleep is Important

MARCH 03, 2023

UNIVERSITY OF MARYLAND, BALTIMORE

SEASON 3

EPISODE 4

The UMB Pulse Podcast

Adolescents: Why Sleep is Imp

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Dana, you made a little tease in February with a coming soon or coming attraction for a grandbaby. Uh, has that grandbaby made their debut?

Dana Rampolla: 0:10

Yeah. Thanks for asking Charles. She arrived, uh, on February 25th. We're super excited that she's here and she and her mama are safe and healthy and trying to navigate new life. And with that, that means. . Mom's not getting a whole lot of sleep right now.

Charles Schelle: 0:27

Really. How about, how about grandmom? Is grandmom, uh, getting any sleep?

Dana Rampolla: 0:31

Well, I, I was pretty excited. I got to be the, uh, the makeshift doula for the event. So I, I was up all night with her. It was a 30 hour long labor from the time her water broke. Oh my goodness. Until the, uh, you know, the morning after when she.

Charles Schelle: 0:46

30 hours?

Dana Rampolla: 0:47

Yeah, it was crazy long. She, she wasn't really in labor when her water broke, so I think that was part of the delay. Not that the whole world once all those details, you're right. But it's interesting because we're gonna be talking about sleep today, and I definitely did not get much sleep for about a 48 72 hour period. And, and of course now I'm back in my own bed, so I'm comfortable sleeping. But as you know, many of our listeners know when you're a brand new parent, those first couple days and weeks and sometimes months, you know, don't, don't include a lot of sleep.

Charles Schelle: 1:18

And for the rest of the world. This is March, and I didn't know how you're gonna get sleep during this month, right?

Dana Rampolla: 1:27

Mm-hmm. , Charles Schelle: You have daylight 12th, so there's an hour loss. Um, St. Patrick's Day's the same week, so if you're, uh, enjoying those festivities, good luck. And oddly enough, that's the same day as World Sleep Day. I don't know if that was a, a good idea. Yeah, I don't think that's a good idea.

Charles Schelle: 1:47

So hopefully we have some advice to, to get kids to sleep on time, uh, with our expert today. Who do we have on?

Dana Rampolla: 1:56

We have Dr. Ze Wang today. He is a professor and a researcher in the Department of Diagnostic Radiology and Nuclear Medicine here at the University of Maryland School of Medicine and um, you know, right on point for what we're talking about, he's going to be talking about how the lack of sleep in children can negatively impact their brain and cognitive development. Um, he's a really neat guy. He's developed several software packages for neuroimaging and he's even a board member and associate editor for several international journals and an a hop reviewer for the NIH

Charles Schelle: 2:29

Great. So here is our interview with Dr. . Wang.

Jena Frick: 2:36

You are listening to the heartbeat of the University of Maryland, Baltimore, the u b Pulse.

Dana Rampolla: 2:49

Dr. Wang, thank you for being here today. We're so excited to have you as a guest to learn more about sleep for those of us either with children or like, um, like me, I have a new grandbaby, so I need to understand all I can about, sleep. You let us study called the A B C D study, which was published in Lancet Child and Adolescent Health recently, and that found elementary school-aged children who get less than nine hours. Sleep per night have significant differences in certain brain regions responsible for memory, intelligence and wellbeing compared to those who get the recommended nine to 12 hours of sleep. So we'd like to talk with you a little bit about that today. This research was funded by the National Institutes for Health, right?

Ze Wang: 3:31

That's right.

Dana Rampolla: 3:32

Okay. And before we jump into this study, Dr. Wang, tell me a little bit about you. How did you wind up researching sleep? You come from a diagnostic radiology and nuclear medicine background, right?

Ze Wang: 3:45

Yes. So it is a great greater pleasure to, uh, talk about my study. So I, I joined the U M B, uh, about four years ago. My research is about the brain. So, um, several years ago I was looking at, you know, the Alzheimer's Disease, and the aging study. So one, um, big component, uh, and the hypothesis about, you know, getting AD and the aging, um, brain is that, you know, the. Sleep has a big role and that's the start of, my sleep, uh, interest. And then I started to look around what kind of data is out. And, uh, years ago I, I had a study of studying brain uh, development. So, uh, so I noticed that there is a huge longitudinal study, uh, looking at the brain development. So then I, I thought, sleep, not just the interest topic for the older people and aging people, right? Uh, but it could be a very important topic for the development of brain as well. So that's how, why and how we study, you know, this study.

Dana Rampolla: 4:57

That's interesting. Well, with your current research, um, you are specifically studying sleep and children, right?

Ze Wang: 5:05

Yes.

Dana Rampolla: 5:06

Okay, and define that age group for me. You say adolescence, but what does that mean in terms of your research?

Ze Wang: 5:13

Yeah, so adolescents is, uh, you know, critical period, uh, for brain development, uh, body development. So, uh, theoretically, I mean, empirically is defined by age. So it, it's, um, between, uh, seven to 16 age or you know, that, uh, that period of time, uh, The

ABCD study has a huge, you know, national wide study. So it started, uh, following the kids from uh, nine to 10 years old and we'll follow them for 10 years. So at this stage we, we, we would still call them as a pre- adolescence cuz they are still kind of, you know, can be, should be treated as a teens or a young, young child

Dana Rampolla: 6:03

Okay. And what year are you in currently?

Ze Wang: 6:07

The study published is based on the data from uh, years of nine to 10. And, um, we also look at the data, uh, from, uh, you know, two years later. So roughly speak speaking, the age range is between nine to 12.

Dana Rampolla: 6:27

And so how old will the students be once this ends?

Ze Wang: 6:32

The studying point is nine and, uh, if we, you know, at the end of the longitudinal study they will be 19.

Dana Rampolla: 6:41

And in general, how many hours of sleep should children in that age range get?

Ze Wang: 6:46

Yeah. So, uh, this, uh, criteria actually was based on the consciousness made by, um, American Sleep of Sleep, , Studies. So they made the recommendation that, you know, young children should sleep at least nine hours per day. Um, so that's the criteria we use to define, which group of children slept the less than that, and which group of children, you know, who had the sufficient sleep.

Dana Rampolla: 7:18

And so when you first started out, how, how did you get your participants?

Ze Wang: 7:24

I have to clarify that, you know, we are using the data acquired by the A B C D study.

Dana Rampolla: 7:31

Oh, okay.

Ze Wang: 7:32

We are not a part of the A B C D study. We are using the data from them and we, um, you know, specifically, uh, use the data to test some hypothesis, you know, created by ourselves.

Dana Rampolla: 7:45

Interesting. Okay. Thank you for clarifying that.

Charles Schelle: 7:48

How many children were part of the study?

Ze Wang: 7:49

So the A, B, C, D study, I will call it as a parent ABCD study, right? Um, so they are following, about 10,000 children for 10 years. And the data we have access right now and, included in the paper, it is about 8,700, um, kids. So we use the data, data from the baseline. So the baseline means the time, uh, when A, B, C, D first then recruited the subjects that the children into the study and the study to, and acquire data. So we call the studying pinpoint as baseline. So they, they have two separate study, right? So one is an annually they, uh, will assess their kids like a cognitive role, um, function and collect their, uh, heirs and record. And, uh, another part of the study is to use MRI to look at the brain structure function. So that is done every other year. And in our study we use the data from baseline, second year and the third year because third year, that's the data we have for the repeated, um, MRI scan. And in the study we look at, um, three big components. So one is sleep. And then the second part is the brain. So we look at the brain structure and the function, and the third part is the outcome. We look at the cognitive function and some behavioral measures. So overall we were, Checking whether these three components, they have some correlations, whether they are linked together. And, um, so our hypothesis is that for the kids who didn't sleep well, uh, sufficiently according to their recommended criteria, so they, they may have, you know, Difference in the brain, uh, structurally or functionally. And, um, at the same time, you know, they may have different difference in the behavioral or cognitive function. And so that's our oral hypothesis. And then we, we, we check the, another, uh, kind of related question is whether this kind of difference will sustain. Because at the baseline you may find something, but it's a big question for where that kind of difference will last, years, like two years. Both questions are very important and, uh, informative for either parents and the policymakers. Right? So at baseline and, uh, both follow up. We found that for these two groups, the children who slept less than the recommended hours, you know, they had, uh, reduced, not reduced, less brain volume, uh, in the gray matter. So in gray matter, we call it a gray matter because, uh, neurons, most of neurons are inside, you know, the gray matter. So in, in MRI that part of a brain, You know, looks gray. So that's why we call it as gray matter.

Charles Schelle: 11:20

Makes sense!

Ze Wang: 11:22

Yeah. And, uh, you know, they are, gray matter volume is, uh, smaller than the other group. That's structure wise. For the function wise, we found that the connections between different parts of the brain actually change. Right. They, they have significant change as compared to the other. So that's in the inside the brain. So for the cognitive function and the behavior it it the same direction. So for the kids who slept, the less. You know, their cognitive um, performance including like a memory or thinking or attention. A lot of, you know, lots, lots of, uh, aspects, right? They are significantly, uh,

lower than the other group. So for behavioral wise, uh, you know, the measure we use including like impulsivity or school performance, you know, it's a similar, uh, similar trend. So they had, , much, worse performance, uh, in terms of, uh, you know, those measured aspects. than the other group. So that's, um, so that's a population level of fighting. And for the second question I just mentioned that we, we were interested in where those effects can sustain, where last for a while, and then we took the same kind, you know, the same kind of, you know, same group of children. And look at their brain and the behavior and, uh, con cognitive function measures at the second follow up year. And we found this quite similar effects. And, that tells us that, you know, the effects is not just the one time they, you know, they sustain at least for two years. And, uh, that's why, you know, it's, um, it raise, you know, bigger concern of, for, for, you know, for how long this will, you know, last.

Charles Schelle: 13:30

You obviously are interested in, in looking at the, the brain imaging, right? What other aspects of the study were included to measure those functions? I'd imagine, maybe some self-reporting was involved from parents or kids, but, uh, were there any like tests or quizzes to see how these children would function as far as like memory and cognitive skills, so you can make that connection. Is the imaging telling you what's really happening?

Ze Wang: 14:00

Yeah, that's great question. You know, the data acquisition, actually it's a little bit complicated. Um, as you just mentioned, uh, some data, uh, they were all reported by parents. Like this right now, the sleep duration, it's based on parent reported, um, sleep duration. And as some, the rest of the data, um, are acquired by either, you know, using MRI machines or separate, um, psychological testing using the, where established the NIH toolbox. So that's, um, performed using an iPad. The children, they are, they're instructed to do, uh, the psychological testing in, uh, quiet room. And, um, we have, you know, the ABCD study, they have a nurse and, uh, coordinator, uh, just setting aside so they can feel free to ask question. Those are quite a, roughly, roughly about the same time if imaging is acquired. The procedure is like this, you know, the kids when they come to the, uh, study site, you know, they will first fill some form and, um, parents will provide, uh, additional answers, separately. So the next step is, uh, to do the psychological testing and then they will, uh, be walked to the MRI scanner room to take pictures of their brain either structurally or functionally. And they, they do have some concurrent task of MRIs. When they lay down in the MRI scanner, they ask to perform some tasks. But that type of task of fMRI is limited. So they have three or four different tasks. Right now, what we studied is called the resting state fMRI. We are looking at when the kids are not doing anything, what's the baseline activity in the brain? So how that will be related to either, you know, separated or collected the base, um, function or behavior.

Charles Schelle: 16:19

I give all the credit to the kids participating in this because getting an MRI at any age isn't easy for folks, especially with how noisy, uh, the machines can be. So having them to do a task on top, of that is, is a tall order.

Ze Wang: 16:33

I agree. Totally agree, yes. That, that this is a bigger engagement and it will be 10 years. And, um, both the parents and the kids are, you know, highly appreciated for, uh, participating ABCD study.

Charles Schelle: 16:49

You mentioned about the self-reporting and, and obviously you can't be bedside by every child, all 8,000 kids, uh, as part of this. Were they given any sort of parameters as far as , sleep times or, did it matter at all when they decided to go to sleep or, or bed?

Ze Wang: 17:07

Yeah, that's a great question. So right now we, what we look at is the sleep duration reported by parents. And, um, sleep is itself, has some many components like, uh, what you just mentioned, the onset of sleep. Also the total duration and, uh, the , segments of sleep. Some kids, they, they may wake up, you know, they may wake up during a night and then then stay alert for a while and then go back to sleep. Uh, you know, for certainly we need, um, a long, consistent, you know, sleep duration. We haven't looked at the other components, and that's our, um, we are doing that right now, um, in ongoing studies.

Charles Schelle: 17:58

Yes. And, and speaking of ongoing studies, I'm not sure if maybe this one, uh, is included in that, but we were wondering about maybe if, how much socioeconomic data is part of this to maybe tell if a child in an urban setting may get as much sleep or, or less sleep than some, uh, who's in a rural setting, for instance. Um, or based on income level.

Ze Wang: 18:25

Yeah, there are, there are many factors that can affect the sleep. So, uh, one factor, as you mentioned, it's a social, uh, economic status and a living environment for family. So we, um, right now we look at it, but we haven't published it. Uh, it, you know, the results are quite consistent with literature showing that, the socioeconomics, uh, it's actually, correlated with the sleep duration and the sleep, you know, patterns. And for, for other factors, like, you know, uh, if their family have some, you know, history, parents history of some disease, and they are, uh, there are some correlations between them. So sleep is, um, itself is a complex. Um, we can create a process, but it, it's also effected by many other things.

Dana Rampolla: 19:23

And so what is getting less sleep mean for a child in terms of short-term abilities and long-term abilities? Um, do you see in effect for these kids who are, who are not

getting what we'll call good sleep over a long period of time, do you see that that's kind of cumulative in negative outcomes?

Ze Wang: 19:44

To answer this question I have to talk a little bit more about the sleep, um, function. So, as I just mentioned, sleep is a process, but it is also a function. During sleep, there are many fundamental process, you know, happening in the brain and the body, right? So, for example, in the brain, uh, it's the sleep time that our brain is kind of replenishing you know, their brain like, uh, wash out some, uh, waste, uh, created during the daytime. It's also, um, fundamental part of memory, uh, consideration. There are many research happening that if you, if you start to, uh, read something right before sleep, actually that helps a lot of memory. So you, you may, um, get a , much better, um, memory consideration. because sleep is the, is it is a critical part of considering your memory. And, um, you know, part of the, part of your, um, you heard your, your experience during daytime is actually kind of refreshing during sleep, right? So that's why you have dream. And, uh, during the, during sleep it of, of course, you have no control of that. So the brain is automatically refreshing, uh, you know, the things you have seen and connecting to your previous memory and experience. So overall, they are generating something, but it is mainly, it's. recycles what you, experience, uh, during the daytime. So based on, you know, those, um, process and function. Yes. You will admittedly think that, you know, if you have, uh, less shorter sleep duration and bad sleep patterns, , the normal brain development process maybe, you know, change or disturb to some extent, uh, that's why, in our study, we found that, you know, shorter, the, the kids who had, um, shorter sleep duration, they had worse, um, school performance and cognitive function. So those are, those are, you know, well known in the literature. Uh, but, but not by a single study. Right. So the trend is there. And, um, to answer your question about whether this will accumulate, right? So right now there is no, there is no, uh, sorted data because the lack of largest study like A, B, C, D, so A, B, C, D will be, I think, will be the first one to follow kids for such a long time. And, uh, it will have such kind of data to at least provide a first, you know, um, kind of clues or evidence for, for your, uh, question.

Dana Rampolla: 22:56

Hmm. That's interesting. So this hasn't been studied for a long period of time.

Ze Wang: 23:02

If the, you know, there are segments of studies like, you know, some studies, they are study, um, for different age group. Um, although you can, you can draw some rough conclusion that if the sleep trend doesn't change, uh, if there's the kids or, um, people, you know, they don't get a sufficient sleep for long time, right? So eventually , those effects may accumulated and the extreme cases of sleep shortage is, sleep deprivation. Sleep deprivation. It's um, it's more like a experimental sleep. Um, You know, sleep or management manipulation. So they would ask the, uh, the participants to, to not sleep for like, for one night or two nights. And the effects are, are dramatic. Mm-hmm. So

basically after the two nights or just even one night, uh, sleep deprivation, you, you can immediately say, Some, you know, uh, waste or toxin, uh, deposition in the brain, but that's, you know, a sleep deprivation. It is totally different from the normal sleep, uh, deficits. For most of the kids involved in the ABC D study, they are still young. They are just the short of, uh, you know, one hour or two hours or three hours, uh, you know, sleep.

, Charles Schelle: 24:40

I was thinking about like how long these studies have to take, you know, uh, before we start to find very basic data almost. The name escapes me, but I was thinking of like, when my sisters were young and I was young. Like our family would be sent like, um, there was a very long term like health study survey where like kids would, would get it in their teens and then it would just be mailed out every like five or seven years. And I think we're just finally starting to get that data after all those, you know, years of surveys.

Dana Rampolla: 25:14

So let's, let's shift for a minute and talk about what, what the data is showing from these studies and how that applies to like real life. So when my kids were growing up, I made a conscious choice not to let them have TVs in their bedrooms. Nowadays I look at parents and think, oh my gosh, so many. So many things that kids can be sneaking right into the bedroom the parents might not even know about. You know, I felt like we had control of that, but kids nowadays have the smartphones and tablets and iPods and iPads and how, how do things like that, um, or at at least, what's your feeling on how do things like that affect sleep? And maybe if you have any tips and suggestions. You mentioned you're a parent. How do we kind of control those things so that they're not affecting our children's sleep?

Ze Wang: 26:02

Yeah, so there is is a trend of, um, getting less and less, uh, sleep, for the children and, uh, adolescents in modern society, uh, because there are lots of attractions including sports, and, uh, you know, the electronic devices. So regarding some of plausible procedures that can help, um, kind of reduce this trend is that, for parents or even relatives, you can implement some, uh, family rules like no, no pads and no, uh, iPhone, no smart watch in the bedroom. Ask the kids go to bed, um, on time every day and, um, doing more physical activity during the daytime, and then they will fall asleep quickly, right? Uh, so overall, you know, there are some very helpful for instructions for implementing, uh, all these procedures that can help.

Charles Schelle: 27:09

Yeah. You know, it's just like taking care of your pets. They say run your dog as much as you can, and so, so the dog will just go, go to sleep. . Ze Wang: Yeah. Physical activity definitely helps a lot because you can, especially for outside activity, right? You, you, you are expose to the natural light and that's totally different from the a pad or, you

know, watch. So those, uh, electronic devices, usually they have a strong blue light. This, the blue light actually activating your brain dramatically. So that's why if the kids, they are using pad or watching TV, uh, you know, for, for hours before sleep, they cannot fall asleep. Simply because, you know, the light activation, surely they will get addition or excitement, uh, you know, based on the content, right?

Dana Rampolla: 28:07

Right.

Charles Schelle: 28:08

I had, uh, something charging in my living room. It was a new device I think I, I got for, for Christmas, and I noticed, and I could just feel that light, even with my closed eyes. It was subtle, but it was in the living room. I'm like, there's something on and it's bothering me, and I feel, and it almost felt like the entire, apartment was lit up, but it was just a subtle light. It was enough to bother me. where you're right, we have so many gadgets, charging, emitting little lights, little indicating lights that it, that it's hard to, you know, get them turned at the right angle and, and just, black everything out. I mean, obviously the, the, the simplest solution would be for me, shut the door, but . But, so, you know, it goes, it goes back to, you know, sleep preferences are, are you someone who shuts the door? Are you an open door? Do you have blackout curtains? You know, little things like that.

Ze Wang: 29:02

Yeah, that's right.

Dana Rampolla: 29:03

And I think too, just having parents model that behavior for their kids, you know, it's one thing to tell your children they can't do that, but then when they see their parents on their phones and devices all the time and in their own bedrooms, yeah, it's a big, that's a bigger, I guess, broader topic.

Ze Wang: 29:19

Yeah, I thought they're agree. You know, the parents actually, are the Best examples, , if you, if you limit your behavior, uh, at least you know, before sleep time, right? So the kids, the children will follow. And if you just, uh, Uh, kind of ask them, or, you know, enforce them, force them to do something. You know, usually it's hard because the children and the adolescents, their brain is still under rapid development. Their control, uh, capability is still not a mature.

Charles Schelle: 29:59

It's great that we're talking about sleep and, and kids right now because sleep has gotten so much attention for kids' development that the studies on how much, um, kids and teens should get is really impacting, uh, school times now. And so we've, we've had recently, uh, California last year became the first state to mandate a later

school start time. The American Academy of Pediatrics thought that the start times were too early and, and high school should start.

at 8: 30:33

30 AM or later to get enough sleep. And even here in Maryland, we're, we're starting to see that change where Anne Arundel County has changed their high school start times to 8:30.

Middle schoolers are now going at 9: 30:44

15. Uh, Howard County is also planning a, a change. So, why is it better for students to go to school later sleep-wise? Do you, do you, are you seeing that Dr. Wang as as, as a good step for schools to take?

Ze Wang: 31:04

I don't do much, uh, you know, kind of research on this topic, but to me, , It does help, you know, for prolonging the, um, sleep duration i, I would just, um, you know, provide, uh, evidence. So for example, during the COVID-19 pandemic, right? So the kids do not, did not need to wake up early because the Zoom meeting or Zoom class war wait, start like nine o'clock or even 9:30. So based on. , you know, based on data even from ABCD, we, we observed that, you know, during pandemic, roughly speaking, the kids, they get a one, uh, one hour or one um, point, five hour longer sleep durations. So that's, uh, that's evidence I can see. Um, some reasons I can see is that, if, because the, especially for teenagers in adolescents, right? They have some coursework to do at, at home and they cannot easily change their sleep on set time, um, you know, quickly. So if they have to wake up early, especially to take, the school bus, um, if the school starts at 7. They would probably have to wake up, um, at 5:30 or six o'clock, right? . So that kind of a preparation, you know, is, uh, it is part of the, we, we will take part of the sleep time.

Charles Schelle: 32:47

Yeah, it'll be interesting to see how this unfolds because I'm sure, as you've seen and the data that you get, you know, sleep is impacted by all sorts of variables, right? And so for, for these high school students, I can imagine like during the Covid times, they're not getting to participate in those extracurriculars that would eat into their night or be able to maybe work jobs because of employment I impacts during covid and, and now that's returned. And so how do they balance now a later start time with sports and, uh, working maybe a part-time job for a few hours at, at night. So it'll be really interesting to, to see what happens. But I guess for your case, even though you're not studying that, Maybe there's these long-term studies, you're gonna have to say, well wait, you know, we've been measuring these kids, uh, sleep and, and cognitive abilities, and now we have the subset of populations that we've studied where they changed their school start times and, and look at the impacts of, of that on cognitive development.

Ze Wang: 33:54

Yeah, you, you are definitely right. And um, actually we are looking at. Looking at that effects because the pandemic perfectly, um, kind of, uh, implement experimental sleep moderation, right? Because the data is clear. So during pandemic, you know, the children, they get a more sleep. And before it's just rigorous good time. And they, on average, you know, their sleep duration is, shorter and now when the, you know, when the school reopen and, uh, ABCD study is still collecting data. So once the new data is here, we can compare how this kind of, you know, accidental manipulation will affect, you know, the sleep and, um, brain and cognitive function and behavior. That will be very important, um, study. I

Charles Schelle: 34:59

can't wait to see it. And, and you've been, um, so filled with information. Um, you know, is there maybe a study that you're working on now that, that, that you wanna tease for us to, to look out for?

Ze Wang: 35:13

Yeah, so one study we look at right now is, um, Uh, it's to kind of replicate, you know, replicate the study we just did based on the parent report. Um, you know, sleep duration. So in a subset of ABCD cohort, uh, they have, additional data are collected using smartphone, uh, not smartphone. Smart watch. And that's a direct more objective measurement of sleep duration and, you know, compared to the parent reported during sleep duration. Right. It's more accurate definitely, because this is directly collected from the, from the wrist of the children. And we're, we're, we're using that data to provide them more accurate and more objective evaluation of the sleep, uh, effects on the brain. And, um, we also, yeah, we, we also did almost finish half of the study. Uh, another study is, um, to look at, um, family, like the family environment in a strong, the living environment, socioeconomic effects and, um, on the sleep and worse brain and behavior. So, you know, sleep is not a, a factor by itself. It is affected by other things. Right, right. And most likely, as we, we show in the paper, you know, sleep affects, you know, behavior and the cognition, but the cognition and the, uh, behavior, they will respectfully affect sleep. So it is bidirectional. So we want to, we want to look at, you know, how are the factors more upstream factors will play a role in this chain, uh, reaction. So overall we can have a much better, you know, more comprehensive of, you know, brain develop. And, uh, in under the moderation of sleep and other, you know, factors.

Charles Schelle: 37:28

About that smartwatch study, where sleep is being measured. Do, um, do the participants get a free Fitbit or, or Apple Watch, or, or they just supplying it themselves?

Ze Wang: 37:39

Yeah, that's, uh, A B C D, uh, as long as I know, um, they, no, no free, they, they will have to return.

Charles Schelle: 37:50

Oh, okay. So they're on, they're on loan. I, I, I got it. Yeah. Yeah.

Dana Rampolla: 37:55

Well, that's great that you can pull other data from this study to use, to look at, at different, different elements.

Ze Wang: 38:02

But, you know, meanwhile, you know, to encourage the, um, the, you know, the kids to participate. Uh, the study for a long time, consistently, right. They A, B, C, D, they do provide, you know, some compensations, you know, to just compensate them their time and to encourage them to keep on the study. Yeah,

Charles Schelle: 38:23

well, I wouldn't mind being compensated a free mattress.

Dana Rampolla: 38:28

Oh, that's a whole nother study. Yeah. Maybe we need to have a mattress person one to talk about the effects of sleep based on the type of mattress. . Well, Dr. Wang, thank you so much for your time today and sharing all of your knowledge and expertise. It's been very interesting just knowing that this big a, b, c study has been taking place, that it's ongoing, but also more interesting to understand how that data is used and what kind of, um, you know, outcomes you're seeing for, for the children. So thank you for sharing.

Ze Wang: 38:57

It's my greatest pleasure.. Thank you.

Charles Schelle: 39:01

You may have noticed there was one less voice today in today's Pulse uh, that's because we have some bittersweet news about Jena Frick. Yeah.

Dana Rampolla: 39:12

Our, our co-host Jena, has moved on to newer pastures. She's taken a position with a, a different organization. We're going to certainly miss her, um, her outgoing and bubbly personality. She's always one who had great questions for our guests, and she's certainly going to be missed, but we wish her the best of luck. She's making a great move for her career. So, Jena, if you're listening, we miss you and we, we can't wait to hear how your, your new gig's going.

Charles Schelle: 39:38

Best of luck, Jena!

Jena Frick: 39:44

The u b Pulse with Charles Shelly, Dana Ramola, and Jenna Frick is a U M B Office of Communications and Public Affairs production edited by Charles Shelly, sound Engineering by Jenna Frick, marketing by Dana Ramola.

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