Dr. Lisa Dixon (00:07):

Welcome to our podcast, Psychiatric Services From Pages to Practice. In this podcast, we highlight new research or columns published this month in the journal, Psychiatric Services. I'm Lisa Dixon, Editor of Psychiatric Services and I'm here with podcast editor and my co-host, Josh Berezin. Hi, Josh.

Dr. Josh Berezin (00:27):

Hi, Lisa.

Dr. Lisa Dixon (00:28):

Today, we're going to talk about a data-rich article that focuses on children's use of acute services during the pandemic. It tells a really nuanced and compelling story, I think.

Dr. Josh Berezin (00:41):

So we're very happy to have Dr. Bonnie Zima, who is a professor and resident at the Department of Psychiatry and Biobehavioral Sciences at UCLA. I'm here to talk about her paper, Use of Acute Mental Healthcare in U.S. Children's Hospitals Before and After Statewide COVID-19 School Closure Orders. So Dr. Zima, thank you so much for joining us.

Dr. Bonnie Zima (01:01):

Thank you for having me.

Dr. Josh Berezin (01:03):

How did you get interested in this particular topic?

Dr. Bonnie Zima (01:07):

What really happened, and I think a lot of people shared this experience, was right after the school closures and the shelter at home, we felt really vulnerable and powerless, and I think also particularly psychiatrists, despite those feelings, we were also asked to really continue to provide psychiatric care. And at least in child psychiatry, what we noticed pretty quickly was that the acuity and the volume went up after the drop.

I think the other thing that we all experienced was frankly, a tremendous amount of strain and fear working very closely with nurses who are on the frontline, other frontline workers. I think in academic centers, a lot of strain on our residents, our child psychiatry fellows, that felt that they had to go in. They were quickly pivoting to telehealth. They were quickly using iPads on patients to interview. And with all of that kind of swirling around, there was a feeling, and I think this has really driven my whole career, was okay what could I contribute? What can I offer that might be positive?

And so I decided to apply my research skills to this large data set and I designed the study. Looked back in my notes, I started designing the study in November 2020. That was about the time that I had learned from the Children's Hospital Association that I worked with that the discharge data was just released, and so the timing actually fit really well. I drafted a pretty detailed data analysis plan with [inaudible 00:02:49] to make sure that the programmer was really clear what I wanted.

The other thing that was really sweet was I am a research mentor to the second author, so Juliet Edgecomb, MD PhD, and at that time she had just joined a child psychiatry fellowship virtually, and I joined her and so she could see how I design and draft and she could go back and forth. And what's

amazing is that she just finished two years virtual training and graduated clinical, like so many of our grads and child fellows. So the other thing too is I did want to, if it's okay, give a shout out to my other co-authors as well.

Dr. Josh Berezin (03:33):

Yeah, please.

Dr. Bonnie Zima (03:34):

Because I think the other thing kind of riffing off concepts of how we're working virtually is the co-authors really were a team science. It was amazing. In addition to Juliet Edgecomb, Jonathan Rodine is at Children's Hospital Association, he's a statistician, and they've done a great job. They provided in kind support access through these large data sets and the programming time, which was great.

In addition to Jonathan Rodine at Children's Hospital Association, the other coauthor was Susan Cochran, PhD, and she's fascinating because I thought how could I do a study with the context of the global pandemic without someone in public health, right? And so she's a psychologist by training, epidemiologist, and is a professor in our school public health, and just was outstanding. And really, her perspective, I think from a public health perspective, really helped us as well.

We had Christopher Harrell, really interesting guy, at University of Florida. He's actually a health information system and management specialist, and we had [inaudible 00:04:46] Patek again, another computer scientist. Medical informatics, Weill Cornell, and what's cool is he just got on the NIMH advisory board and is a real leader in EHR pheno typing, and we're very fortunate that both Chris and [inaudible 00:05:03] are interested in mental health and how to apply some of these advances to mental health services research. So that was incredible.

We also had Qi An Sang, and Qi An is also totally cool. He's a biostatistician, has worked with Health Services research, he knows his traditional research methods, but he also knows things like machine learning. He was very exciting to work with. And then my senior author is Regina Bussing, who I've co-authored before with her over the years, and she's, as you know, a child psychiatrist, Health Services researcher, she and I met many years ago when she trained at UCLA under Ken Wells. She's had a very impressive career, and most recently was chair at University of Florida.

Dr. Lisa Dixon (05:51):

Yeah. She's been a tremendous contributor to Psychiatric Services as a journal. It's so interesting to hear your team and all their talents and skills because it really brings to life that the acquisition and understanding and processing of new knowledge takes a team, it really takes ... I mean, and you as a lead making it relevant clinically, I think. Obviously, there are others on your team who could do that as well, but Psych Services publishes articles that can have immediate relevance and impact for the field, and so you have this complex team asking really simple questions that matter. So we're excited to have you here on the podcast.

Dr. Josh Berezin (06:38):

Maybe we could step back and talk about what was the ... We've alluded to this data set. What was the actual data set that you were looking at that allowed you to get such a broad picture of service utilization over this time period?

Dr. Bonnie Zima (06:51):

Okay, so this data set is called the Pediatric Health Information System data base, and we lovingly call that the PHIS, the P-H-I-S. Okay, the PHIS. You see lots of papers using the PHIS, and bottom line is it's really cool. It's basically hospital discharge data from 49 tertiary children's hospitals in the country, and it comes to the Children's Hospital Association. And for this one, we had a complete data set for 44 of U.S. freestanding children's hospitals.

Dr. Josh Berezin (07:24):

What percentage of that is of all ... Is that all children's hospitals and how many children's hospitals are there in the country?

Dr. Bonnie Zima (07:30):

I don't know. I don't know the answer to that, but I think that we do need to be mindful, these are tertiary care, so it's more likely to be in urban settings. It's more likely to be caring for more severely ill children. Again, it's just a little slice of the pie, but there were advantages to this set versus a Medicaid claims data. That's what we went with.

Dr. Josh Berezin (07:57):

And the data set tells you about ... What's contained in the data set? What information do you get about presentations, admission, discharge reasons?

Dr. Bonnie Zima (08:06):

Basically this is a discharge data set. It's data that's reported by all the children's hospitals and then it's aggregated. The bottom line is that we created a sample so that we looked at all cause ED hospitalizations and then we stratified it by those for primary general medical, which would be whatever the primary diagnosis was on that discharge. And then we said okay, and then what subset are for primary psychiatric disorders? And so again, we tied the encounter, the ED, or the hospital discharge to the primary diagnosis.

And then for the type of diagnosis we stratified by a classification system that I created that also stratifies by and aligns with by DSM-5 and allows for ICD-9 to ICD-10 crosswalk, and so that's how we got the disorders. But back to your point, the final sample were children three to 17 year olds, 44 U.S. children's hospitals, and we had a total of over two and a half million encounters.

Dr. Josh Berezin (09:13):

So you're looking at 2020 data from the time of the school closures, the spring, summer, and fall of that year, and then you're using 2019 as kind of like a comparator.

Dr. Bonnie Zima (09:25):

Right.

Dr. Josh Berezin (09:25):

Baseline to see how it changed over the year.

Dr. Bonnie Zima (09:28):

That's right. That's right. And so we just did a head to head and we treated it by the calendar, so that you'll see that the dates aren't exactly matching because I wanted to make it match the school. The first Monday that school shut down, matching the first ... The same Monday and ideally the school year in 2019.

Dr. Josh Berezin (09:49):

So you're getting kind of like a baseline though from 2019.

Dr. Bonnie Zima (09:52):

That's right.

Dr. Josh Berezin (09:54):

Seeing what happened during 2020.

Dr. Bonnie Zima (09:54):

That's right.

Dr. Josh Berezin (09:56):

When everything was going off the rails. I think we can all agree.

Dr. Bonnie Zima (09:56):

Right. Right.

Dr. Josh Berezin (10:02):

And then do you also think about the medical sort of diagnoses as a baseline that you're also comparing to?

Dr. Bonnie Zima (10:10):

We did was we said okay, first, can we replicate what the CDC is reporting using the children's hospital data, right? And so that's where you see the large figure with the trends where we say okay, we know all cause acute care encounters dropped by 44%. That's huge. And that's consistent with other studies using other databases, so that was a nice validation. But then when we looked and we stratified general medical versus psychiatry, we found that there was a two fold greater reduction in ED discharges than hospitalizations, meaning that ... And we experienced that, right? You're not going to go to the ed unless you really have to, right? And so that was consistent.

Then we did a double check on our primary general medical care. Okay, here acute mental healthcare goes down 2.4 times less in general medical. And when I say acute, that's where I'm lumping ED in hospital together, okay? Then I separate it and I say okay, let's just look at ED. Okay, does it hold true? Yeah, look, mental health ed discharges is almost two times less compared to those for general medical. We look at hospital. Oh, dear. Decline in mental health hospitalizations was 3.4 times less than for our mental health versus our physical. So what happened here is pre-post COVID mental health hospitalizations only declined 8%.

Dr. Lisa Dixon (11:43):

I think it's really important for the listener to get this because it took me reading this several times. It's all going down, but mental health is going down less.

Dr. Bonnie Zima (11:54):

Right.

Dr. Lisa Dixon (11:54):

So it sounds like it's kind of more, and it is kind of more, but it's actually more because the reduction is not as great.

Dr. Bonnie Zima (12:04):

That's right. So a real challenge here is it was relative percent changes throughout, which made it more difficult to write clearly, but that was the challenge. But that was also how the CDC was reporting, and so I wanted to make sure there was some comparability with a different data set.

Dr. Lisa Dixon (12:22):

So it's keeping in your mind that the context where there's a pretty big reduction for a whole variety of reasons, but less of a reduction.

Dr. Bonnie Zima (12:32):

Correct.

Dr. Lisa Dixon (12:32):

On mental health.

Dr. Bonnie Zima (12:33):

Correct. And then what was most important to me was to stratify by the psychiatric disorder, and that's when I was like aha, okay. My gut feeling that you shouldn't lump, it was true. When we looked at suicide or self injury, the emergency department discharges only declined by less than 10%, pre-post. Okay, you look at hospitalizations for suicide and self injury, actually they increased 12.8% in the 2020 versus the 2019, okay? That's like okay. And we looked at eating disorders. What was surprising there, emergency department went up 18.6%, hospitalizations went up 12% during the COVID. And then also when we looked at psychotic disorders, which sometimes people minimize in children, frankly, but ED visits for psychotic disorders for children only declined 6%. That's not much. Okay? You look at hospitalizations that increased, 10.8%.

So what was really important, there was those disorders that are involving concerns about child safety, concerns about metabolic abnormalities, abnormal, vital signs, severe weight loss, or really psychotic symptoms, hospitalizations were going up. That's what was driving this disproportionate less of a decline, right? In mental health diagnoses. But that was really an important finding that it was these disorders, the suicide, the eating disorders, the psychotic disorders, that were driving the ED and particularly the hospitalizations.

Dr. Josh Berezin (14:25):

And you lose that if you don't stratify.

Dr. Bonnie Zima (14:25):

That's right.

Dr. Josh Berezin (14:28):

It all kind of gets lumped together, so the general picture is sort of utilization goes down very early in the pandemic across the board and then comes back up either around or a little bit below. But that story is not really the whole story when you look at some of the more safety concern disorders that you're talking about.

Dr. Bonnie Zima (14:52):

Right.

Dr. Josh Berezin (14:53):

And that's what you get from stratifying the data is that you get a much clearer picture of what happened.

Dr. Bonnie Zima (14:59):

And you also have to remember during that time period, remember how concerned parents were? There was no vaccine. You don't take your kid to the ED or want to go take that kid to the hospital unless you are really concerned.

Dr. Josh Berezin (15:13):

Here's what's so commendable about diving into these questions because it was ... There's so many different things that are happening, right? So you've got reluctance to go to the emergency room to present for care, and at the same time, I don't know how open a question it is, but it seems like there's at least an idea that maybe acuity is increasing in the community as well. So how do you figure out what the balance is between reluctance to present for care and the mental health effects of the pandemic.

Dr. Bonnie Zima (15:13):

Right.

Dr. Josh Berezin (15:48):

The school closures.

Dr. Bonnie Zima (15:48):

Right.

Dr. Josh Berezin (15:49):

The loss, the trauma, and all that stuff. It's very, very complicated.

Dr. Bonnie Zima (15:54):

I love your question because that is the conundrum. We need a better data infrastructure on a large scale to really understand the clinical need for services, right? That we can't tell on an administrative data set, and we really do not have large data sets that allow us to really do that level of looking at

stratification by type of psychiatric diagnosis over time, right? Most of our databases are screeners or surveys or parent report, or like here, the other side of the elephant is administrative claims data, right? So we look at use as a proxy. But you're absolutely right that what we cannot do in this study is estimate the need, the clinical need, for acute mental healthcare during this time period.

So all I know as a possible explanation is that we had a lot of people overriding any sort of avoidance, and when I looked at these type of disorders, I thought okay, it's safety. They really, really are scared about their kid.

Dr. Lisa Dixon (17:04):

Is it possible to examine the co-occurrence of so-called medical and mental health disorders?

Dr. Bonnie Zima (17:13):

Yes. Yes, and I did that in a prior study because I thought it was really important that utilization and costs differ by whether a kid is a primary, general medical secondary psychiatric disorder, or if you flip it, the comorbidity. Or you just have pure psychiatric disorders in your first and second diagnosis, and that's a different paper, and the bottom line is yes, it makes a big difference in costs and hospital utilization. And I did that one hopefully to put in the literature methods so that people do exactly what you say, look at comorbidity and look at how the order varies.

Dr. Lisa Dixon (17:55):

Yeah, I guess I was wondering if perhaps ... I was struck by the eating disorder findings and whether there were co-occurring medical conditions that may have concerned parents and contributed, again, I think to this notion of getting over their anxiety about coming for help.

Dr. Bonnie Zima (18:15):

Yes, and you'll see also in the limitations of the paper that I probably underestimated for eating disorders because this data set did not capture those kids that went onto a medical unit first and then got transferred to psychiatry, okay? And that's possibly true for suicide as well, that if it was an overdose and the kid went to the ICU and then was transferred later, I didn't capture all of those cases.

Dr. Lisa Dixon (18:45):

I find myself wondering, I mean, you're such an honest scientist that you're very clear about the limitations of your data. I'm interested in how you think about what are the clinical implications? What does a pediatrician, or a child psychiatrist, or a child therapist, or a policymaker, or an agency director who runs a child based service, what can we take away from this work?

Dr. Bonnie Zima (19:13):

I think the most important take home point is the findings around suicide and depression, so if you see before and after, suicide and depression remained the top conditions pre and post COVID for ED use and hospitalizations. Then we see, again, this seasonal trend with increase for ED use for suicide, increased trend for depression, higher during the pandemic in the summer. We see increases in hospitalizations again for suicide, up 41.7% by the fall, and in depression, not as much, but still about the same level as pre COVID.

So the bottom line is during this pandemic, it raises awareness that we must have public health strategies in place to mitigate the things like risk of depression, risk of suicide. Heads up. Heads up that

this is what's driving mental health, ED, and hospitalization. Not new. I mean, I think there are lots of national recommendations about this, but I hope that my study in some ways can be one more piece of evidence to support that advocacy and to raise awareness. And what we don't know is how this trend has continued over a longer period of time, right?

And the other issue that came out in my study that was a surprise was we didn't find differences statistically by race or ethnicity, okay? It doesn't mean that disparities weren't happening, it's just that my study was during the very early phases. Maybe I didn't have enough sample sizes. I don't know, but it wasn't statistically significant. But I really think in the future one thing that we need to do is link this type of data to things like the American community survey, right? Or some other data set that allows us to geo code the zip code and then map it onto household characteristics.

And here, I really want to give a shout out to our U.S. Census Bureau. They did an outstanding job on a household pulse survey. You can Google it. You can look at changes in household characteristics and you can stratify it by whether that family has children or not. And what's incredible is they actually have screeners for depression embedded in that, and it's a dashboard and they continue to update it. So those are the kind of data sets that ideally I should link in the future.

Dr. Josh Berezin (21:56):

Do you think that there is maybe some underlying correlation that maybe can't measure in this data set between the severity of the outbreak within a given community and utilization? So if you're looking at 44 hospitals across the country, even starting with school closures, right? My memory and just even now is that we have a very geographically dispersed pandemic that hits in different places at different times and I would imagine that service utilization really ... I would guess that it changes based on how many people are getting sick in a community.

Dr. Bonnie Zima (22:36):

Yeah. I actually designed a study like that for a NIMH proposal. It didn't get funded. I used machine learning instead of DID but ...

Dr. Josh Berezin (22:45):

I would've funded you.

Dr. Bonnie Zima (22:48):

But exactly, we had proposed to integrate pandemic level indicators, and this is a shout out to Johns Hopkins. I mean, they were on the ball right at the beginning of the pandemic and still provide incredible resources as far as if you want to track vaccination rates, positive rates, all the way down to your community, you can do it.

Dr. Josh Berezin (23:10):

So when you think about this study and studies in the future, what are some of the big gaps or what would help kind of answer some of these really large and complex questions that you're asking?

Dr. Bonnie Zima (23:23):

Yeah, I think, Josh, your earlier question about what is the impact of school closures and child mental health, right? And over time. I mean, that's really important. And it's like these questions are raising, really highlighting the need for improved data infrastructure for child mental health. How do we

accelerate research? How do we ... In aligning clinical need, right? Detecting clinical need, whether it's prevention, early intervention, treatment, among a child, and what is the timeliness, the access to appropriate care and care over time, right?

And so what's happening is our data sources right now are very fragmented, right? We might have a large national survey from a federal agency where we have claims data, like we talked about today, but where is really the national will, the political will, to invest in a data infrastructure where we actually can examine clinical need for prevention, early intervention, and treatment of child psychiatric disorders over time and how well they access care, timeliness of that care, and the quality of the care, right?

We have to have that data infrastructure, which is expensive to develop and maintain, but that's ideally where we need to go because only then can we really generate data that says yes, there's a good return in our investment in child mental healthcare. Because we have this data infrastructure we can track over time, and we tag it with proximal distal outcomes that are meaningful, okay? In 20 some odd years of talking about this as a national priority area, this study is just one example of a need for that better infrastructure.

Dr. Josh Berezin (25:29):

Well, that's probably a good place to end, but before we do, I just wanted to go back to your initial response to what was going on when you started the study, and I think you were talking to and recalling this real sense of ... I don't know, for me like chaos and helplessness, and it seems like for you, you turned your skills into something that was really positive. So I'm just wondering if you ... Now that we're two and a half, three, however many years later we are, how that's changed over time with the publishing of this and other work, the work you've done?

Dr. Bonnie Zima (26:09):

A lot of the initial response I had from the study was it was validating to know. For example, CEOs of children's hospitals that lost ... Saw their income go down, right? But also the strain on having to provide mental health services to kids. So I guess to me, when I had those discovery moments and the data that was validating, and I think this opportunity to translate this data into an important story that hopefully can be used by administrators, policy makers, providers, to really validate some of their experience, right? And hopefully they can use this to advocate in ways to improve care for kids.

Dr. Josh Berezin (26:56):

Well, we're very glad that you and your team did this work, and thank you so much for joining us on the podcast today. It was a pleasure.

Dr. Bonnie Zima (27:03):

Yeah. Thank you for the opportunity.

Dr. Lisa Dixon (27:05):

Yeah. Thank you so much, Bonnie. This is impressive in depth, precise, challenging work, and I'm so happy that you are able to process it so that we all can understand it and grow from it.

Well, that's it for today. We invite you to visit our website ps.psychiatryonline.org, to read the article we discussed in this episode, as well as other great research. We also welcome your feedback. Please email us at psjournal@psych.org. I'm Lisa Dixon.

Dr. Josh Berezin (27:41):

I'm Josh Berezin.

Dr. Lisa Dixon (27:43):

Thank you so much for listening. We'll talk to you next time.

Speaker 4 (27:47):

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