2018 NCSBN Scientific Symposium - Practice: Night Shift Errors: Examining the Root Cause of Nurse Practice Errors During the Most Dangerous Time for Patients Video Transcript

Event
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- [Elizabeth] Preventing nursing errors and ensuring safe nursing practice require a thorough understanding of the root causes of errors. As one of the initiatives for promoting patient safety, NCSBN developed the first and the only national nursing adverse events database that links nursing practice and the discipline.

Data collection started in 2008. Today we would like to share with you some recent findings. In this presentation, we'll address our three research questions: when did the error occur, and what are the patient outcomes? What are the possible risk factors? This is a distribution of a participating boards.

Since 2008, 26 boards submitted about 5,000 cases to the database. So here we would like to take the opportunity to thank all the boards that generously shared their data with us. This is a retrospective case review study in which nurses were reported to the boards of nursing for committed errors.

Cases meeting the following criteria were used for the analysis. We have one nurse, one identifiable patient, and there is a practice error. Cases lacking information on when the incident occurred were excluded from the analysis. Also excluded were the cases that involved intentional misconduct or criminal conviction.

These cases could have different error trends and different contributing factors. In this study, work shift is defined based on when the incident occurred. So night shift is defined when the incident occurred between 11:00 p.m. to 6:59 a.m.

Data collection consists of 45 mandatory questions and 17 optional questions. After carefully reviewing all the cases submitted by the boards of nursing, we identified 2,069 cases that met the case selection criteria.

These cases were used for the current analysis. Here are the main findings. Our analysis shows that there is a high proportion of errors occurred during night shift compared to the day or evening shifts.

In addition, we found that 55% of the night shift errors resulted in patient harm, and 22% of them may have contributed to or resulted in patient death. This is the distribution of the patient harm cases across different shifts.

Altogether here we can see the total number of patient harm cases reported during night shift was twice higher than the other shifts. So we will think about what happened during night shift?

Here we found that 57% of the night shift errors related to lack of intervention on behalf of patients. In addition, that 74% of these errors resulted in patient harm. A further breakdown analysis shows that during night shifts, there is a high proportion of the errors related to no intervention at all compared to the other shifts.

So now we try to identify what are the possible factors associated with the elevated error rates during night shifts? First, we look at the license type. Here we found that compared to LPN/VNs, there is a high proportion of RNs committed error during the night shift.

Here we have to point out that we do not have the exact staffing ratio of the nurses working across different shifts. Here we are only presenting the descriptive statistics around the nurses who committed the error. Then we look at the work hour issues. So,compared to the day shift, we can see that a high proportion of the nurses, they committed error during night shift when they worked on 12-hour shifts.

So when we go back to the previous finding on the elevated error rates for RNs, we found that 59% of the RNs versus 29% APRNs, when they committed the error at night shift, they worked 10 to 12-hour shifts.

So, at this time, we cannot draw a conclusion whether the elevated error rates for RNs was associated with the longer work hour or because more RNs were assigned to work during the night shift. So, we decided to ask nurses, "What's the causes of the errors?"

Over 800 nurses shared their perceived contributing factor during the interview. And we found that in general, work stress, lack of support were cited as the main contributing factors. But for the night shift nurses, a high proportion of them indicated that fatigue or lack of sleep contributed to error compared to the nurses working on day or evening shifts.

Interestingly, when we look at the nurses who work at night shift and claimed that lack of sleep contributed to errors, we found 41% of them, they worked 12-hour shifts but 44% of them, they worked on an eight-hour shift.

So, therefore, the longer work hours may not have the only contributing factor to fatigue, or lack of sleep or to errors. Some other factors such as how a nurse copes with the circadian rhythm change during night shift or rotating shift should be considered as well. This study is based on available data voluntarily submitted by board of nursing.

Due to lack of control data, so we cannot draw some certain conclusion, the definitive conclusion at this time. Despite of these limitations, our analysis showed that there is elevated error rate during night shift, and these errors resulted in patient harm.

In addition, we found that errors relating to intervention, lack of intervention, occurred more frequently during the night shifts and that that error also resulted in patient harm. Finally, our data suggested that longer work hours or fatigue contributed to the elevated error risk during night shift.

This is an exploratory study. We still have some unanswered questions. So NCSBN planned to initiate a follow-up study to gather data directly from hospitals to further drill down to the root causes of errors.

So to learn more about that exciting studies, so we can hear the studies at the front, Dr. Emilie Shireman. So, thank you. - [Dr. Shireman] So yeah, just like Elizabeth was talking about, there are obviously some reasons why there are more practice errors on the night shift.

And I'm going to talk more generally about patient safety events, which may or may not kind of include the definition of the nurse practice there. But there are a lot of surrounding factors that contribute to why there are more of these events on the night shift but to really get into what was going on the night shift, how that unit usually operates, staffing ratios, stuff that a database can't really capture we're going to start a large study on, you know, what happened on the night shift when an error occurred and when a patient safety event occurred?

But to take a step back talk about why NCSBN would even be doing this, let's remember that conservative estimates of the number of people who are killed by medical errors in the hospital are at 250,000, some estimates are even larger than that. That makes it the third leading cause of death in the United States but another thing to keep in mind as to why we are interested in this is that there's another victim of an error and that's the nurse themselves.

Nurses are substantially impacted by an error that happens. And part of what this study will entail is how can we pivot from thinking that an error is something that should have a punitive response to how can we learn from that and make sure it doesn't happen again? How'd the systems set up this nurse to then be, you know, at the point where, you know, at the head of where an actual error occurs?

How did everything else kind of contribute to that? How can we make sure that there are systems in place that keep that from happening again? So just generally, NCSBN is going to propose a national study on patient safety events during the night shift. I don't have...obviously, this isn't me presenting results or anything like that. So we're just kind of going to be talking broadly about why we're looking into this, what we might be wanting to gather.

But the study plans are going to be up for review by an expert panel and also approved by our board of directors, so. But why the night shift in particular? Well, besides, you know, TERCAP showing that

there are more errors on the night shift, there are a lot of intersecting factors that make the night shift more dangerous. And all of these kind of coincide to make a very complex, you know, atmosphere, and any one of these could kind of interact with another one to produce a time of day that is particularly dangerous.

I'm going to go through these in a little bit more detail. And the first and most obvious is fatigue. It's a night shift, right? Lots of nurses work on rotating shifts. I don't need to tell you guys this but just so you guys kind of know what I'm talking about, that nurses will work day shifts, evening shifts, if there is an evening shift at the hospital and then night shift, which means that their sleep schedules might not be acclimated to the night shift.

That means they might show up to work sleep-deprived, tired, what have you and that can decrease motor skills, cognitive skills, attention span, and this study, in particular, found that attention was impaired after a night shift more than after a day shift. And what kind of makes this even more difficult is that people in general are, you know, are not very good at telling whether they're impaired by their own fatigue.

"Are you too tired to do this right now?" isn't a question that people are very good at answering. Additionally, let's say you're not a rotating nurse you're a permanent night shift nurse. Well, these nurses suffer from diminished well-being that can also impact their propensity to commit an error. Night shift nurses are at a higher risk for heart disease, diabetes.

The WHO classified shift work as a carcinogen. You're more likely to get cancer if you work shift work. Also, if you ask a nurse why they're absent from work, why are they quitting, you know, being a nurse? Shift work is part of what nurses will cite. And in this graph here, you know, as for the kind of what facilities might get out of this, night shift nurses take more sick days because of personal illness not even because they need to take care of a sick kid or vacation or whatever.

Sick days due to personal illness are higher for permanent night shift staff. And what kind of complicates all of these issues, you know, outside of fatigue and outside of sleep schedules, which is a big part of it, but there are facilities and facilities operate differently in how they structure the night shift and also the people that work the night shift are different from people who work the day shift.

On the facility side, some facilities utilize technology specifically to mitigate dangerous situations. For example, programmable infusion pumps have been shown to decrease errors in this graph here, have been shown to decrease errors when a nurse is administering medication and it isn't interrupted. It's a particularly dangerous time. But as a broad definition of error, which their definition was admittedly a little broad to get 89% errors, but still having a programmable infusion pump is something that you could have if, for example, you expect your nurse to get interrupted because night shift there are fewer nurses on the night shift, for example.

But then on the nurse side, the nurses who work the night shift are more likely be closer to the initial date of licensure. They're younger, they're less experienced, facilities are less likely to have on-the-job training during the night shift, which means a nurse will need to come in during the day if you had a new technology you needed to train on. So the facility and the nurses, those are all different. All of this it's kind of... there's a lot of, you know, inter-facility and shift differences.

And then finally, there's scheduling issues. They are present all times of day, obviously, but they're still there at night. And it still interacts with, you know, the fatigue and with the facility characteristics and all of this. A night shift could be a long shift, it could be 12 hours or longer. It could be the second of a consecutive shift. It could be a quick return which is two shifts separated by less than 11 hours.

It could be overtime. All of these, you know, shifts and errors have been pretty heavily studied. And all of these types of shifts, long, over time, all of that, all increase propensity to commit an error, so. So we know a lot about how the night shift is different from the day shift. We kind of just went over a lot of differences, how they are different.

But there are also a lot of unanswered questions. For example, what is a regular night shift like for a unit, and how would a night with a patient safety event or with a nurse practice error or a near-miss, how was that night different? Maybe your staffing ratio is lower in this one unit versus this different one okay, that's great, but then what is normal for you guys?

We can't expect every unit type, every facility in every state and, you know, every kind of rural, urban, all of this to kind of have some kind of weeks, you know, normalcy is the same for all these places. That's not really realistic. But, you know, for what is normal for you guys, how did that night differ?

Was there something unusual that happened? Did you have one, you know, fewer person there than you should have? Was there a patient that was in the ward or in the unit that maybe shouldn't have been there, for their acuity level, they should have been somewhere else? Also, you know, how do all these intersecting factors, you know, how do they work together?

We have overtime, we have all this shift stuff, we have all this fatigue stuff, we have the facility and the technology. How do these interact? Is there a perfect combination? Or if one of these was there, could we have prevented a patient safety event that maybe otherwise had happened? And another is narrative accounts of patient safety events have been underutilized, I think.

There is some work about, you know, reading through these and trying to kind of gather some general information to allow quality control or charge nurses or whomever to start to, you know, walk back an error and see, you know, why did it happen? But there's a lot more work kind of in, like, aviation safety.

So in the aviation safety molt, what can narrative accounts of errors tell us? And finally, you know, I've kind of talked about some really broad areas. But are there any other causes of patient safety events on the night shift that have not been studied? So, that's kind of an easy one. So the general goal to look at all these, to bring together these...what we know from the literature along with the things we'd like to discover, we're going to begin a longitudinal multi-site study on the surrounding factors of nightshift patient safety events.

And more specifically, you know, what are the surrounding factors? So what we were trying to do is kind of gather data from a lot of different angles. And I'm going to go through generally what we're going to look at, but experts from these institutions here are going to review our protocol and measures as well as our board of directors.

So the three key times that we're looking to gather data is first at study initiation and that is to gather the general data about the facility, do you have a fatigue management plan for example? Which could involve nurses taking naps which I know has a lot of HR implications to it. What is your staffing procedure for the night shift? What is kind of your aimed staff to patient ratio or RN to LPN ratio, stuff like that.

And then we're going to gather data nightly. And we're going to gather, you know, information that is known to contribute to patient safety events like fatigue level of the nurses, like acuity levels of the patients. Did anything unusual happen tonight? Stuff like that.

And then when an error occurs, it will trigger another set of data collection that will involve an interview with the charge nurse and with the nurse...an additional nurse or nurses involved in the error. And we'll gather some more in-depth information but then also a narrative account of the error. And after we're done, we'll be able to look with a longitudinal lens. Here was usual for them, this was that night, how was that night different from a regular night?

But then additionally, we're going to have all these narrative accounts of errors. And what we can do, like I was saying in the mold of aviation safety, is to use machine learning and to read through these and to automatically categorize them by their contributing factors with the ultimate aim of putting that kind of tool in the hands of facilities so that if they have their own, and lots of facilities do, they have their own method to say, "Here's a near-miss," the nurse goes over computer and enters in some information that they could then take that narrative account that will give them the contributing factors, and then they can more quickly address the causes that led up to it.

So I'm closing with a quote from Lucian Leape. He's an MD, but he's big in patient safety and you can read...I don't need to read it but just kind of the essence is trying to say it's the system that sets nurses up to make errors. And I think it's going to be important to keep in mind when we try to get the buy-in of nurses to tell us something that might be traumatic, that's really personal that, you know, threatens their, you know, reputation as a nurse.

They might feel very bad about what had just happened but to allow them to be honest and to give us information about what happened will involve us communicating to them. We're trying to set the system up to be safer. Because you were there at that moment but there were a lot of things that happened in the background that let this happen.

So, if you're interested in hearing more about it, you can always email me. If you know a facility that might be interested in participating, would love to gather that kind of information. We're getting the panel together beginning next month, and we're hoping to get it to the board soon after that. So, thank you guys. -

[Woman 1] Do you have time for questions for Elizabeth or Emilie?

- Oh yeah, I'm sorry. - [Woman 2] Could you go back to that infusion pump slide?

- Yeah.

- There are a couple slides that confused me. So that looks like the error percentage was 89%.

- Yeah. It was a pretty intense... they really wanted to...I can send you the actual paper from this. They really wanted to make sure that they made an error. So their definition of error included pretty much anything at all and not just, like, did you give the wrong medication? Although that was part of it. But, like, any part of it included.

This error percent isn't, like, any harm actually happened to the patient 89% of the time.

- It was just, like, alarming. Like, they almost never get it right.

- Yeah.

- And the other...

- It was an experiment so they kind of really wanted to...yeah.

- But big difference with pumps.

- For sure.

- Then I wondered about that 12-hour shift slide. It didn't make sense to me. I think maybe I just...it wasn't up there long enough.

- Oh, you mean Elizabeth's? Sure, I can get back to yours. - [Amanda] Yeah, I get it, yeah. Where you showed 8, 10, 12 and then... -

[Woman 3] Because you said the shifts were a certain amount of time.

- First, when we talk about work shift, we talk about when the incident occurred. But within, for example, night shift it could 11:00 to 6:59 a.m. But nurse could work 8 hours during this time, could be longer 12 hours. Amanda, which slide you're talking about?

- Go back. The one that showed 8, 10, 12.

- Okay. So that should be the... here we go. Okay.

- Yeah, because it didn't fit in with the parameters of the times that we'd shift [inaudible].

- So, based on your experience, you thought which part should be more error occur? So here...

- I feel like if I'd work at 12:00, I'd make less errors on the night shift but more on the evening shift, I guess.

- Right. And the 12-hour shift, it looked like you made more errors in the evening than you did in the night, 47% made evening shift errors [inaudible] 12 hours and only 44% [inaudible] 12 hours made errors on the night shift.

- Exactly. Your interpretations are right. So these are the data we found. So, in fact, we have to say each facility, when we conducted this studies, how to define the work hours work shift it's difficult about night shift. But these are the issues.

I think I do not answer why it looks like an evening shift has more trouble especially when work under 12 hours, so they get more trouble. It's possible do you think because it's a transition time, people start to work from these 12 hours in the hospital. So evening time is a bit when the day nurse left.

Is there anyone could know?

- If you remember, on your night shift, your 8-hour night shift was even higher than your 12-hour night shift, 47% versus 44.

- Yes. Based on our data. That's the night shift. But here, in fact, when we started the study, we even think about, "Oh, shall we just close together to compare the day shift and the night shift?" because sometimes it's very hard to say when the incident occurred during certain time, yeah. But this side the purpose we want to point out is when you get to the 12 hours either evening or night shift, you got more errors.

But how to distinguish why the evening shift get longer hours. Hi, Michelle. - [Michelle] [crosstalk] a question. Just like to clarify. I think...just one second...it was 250,000 people die in a year?

- Yeah.

- So, 250,000 a year, from the United States?

- That's 700 a day.

- Where did that come from?

- So I want to know, is that [inaudible]?

- I think that their estimation...I think that it's hard to say because I think that their estimation of how they determined whether somebody did or didn't...I think, like, in the beginning years they just said if you were coded with a new, like, ICD code after you came to the hospital and then you died of that, then that was it.

But now they've changed the definition so whether it's going up or down I'm not sure but I think it's hard to tell.

- Yeah. I thought the numbers were reportedly more than that.

- Yeah. So yeah, Johns Hopkins Medicine put the 250,000 out there and in their kind of press release for it, they even said, "We know of higher estimates, some that go up to, I think, 400."

- And then I'd also like to know what's United States compared to the other parts of the world.

- Yeah, that I don't know. See, what I think makes it really hard is that they're trying to determine this by looking at, like, billing. And I think that that probably in at least, you know, single-payer countries, it's probably easier to estimate. I'm not really sure of the comparison though. - [inaudible]

- Right, yeah. Absolutely.

- One more. Rosie. - [Rosie] I'm just curious. In your models that you're going to develop, there's a lot to be learned from your study where you were looking at errors. And one of the things that came forward was

[inaudible] whether that's recognition or intervention. I'm just wondering in your study, did you find [inaudible] patient safety [inaudible] event?

So we know that the themes are [inaudible] medications, times of transfer, communication. When you're talking about more of the environment and the contextual issues, are you going to look at it relative to those themes, or are you looking at errors in general?

Because I just wonder if there's more to be learned contextually if we know that these are the top five errors that occur and then you look at them at night, what are the implications or what do you learn about nursing [inaudible] to that?

- That's a good question. I haven't really thought about kind of having a different sort of way to look at...if I'm understanding your question right, like, a different way to for example, this is a medication error versus this one was a not intervening error. And then kind of putting them in those buckets and then looking within those buckets.

I hadn't really thought about that yet. I mean, we definitely...with what we've got playing, we would definitely know what happened, you know, who it happened to, what time it happened, stuff like that. So we'd always have the ability to do that later. But at this time, I hadn't really considered it. I'll keep it in mind. - [inaudible]

the data that's available through the ministry of medicine or IHI or [inaudible] medication and all of those are clustered. So it would be so interesting to look at your model and how does it really... what we already know

[inaudible] system means that we're not really making a difference there.

- Right, right. No, that'll be important especially as we start to kind of hammer things out in our protocol, in our data collection to make sure that it lines up with stuff like that. Because I had already heard from fatigue people a whole spiel on what is the night shift? Because if you want us to be able to

kind of use these data, and use these results and maybe even merge them with some of our studies, is we're going to need to get on the same page about that.

Because if it's off an hour or whatever then, you know, we're now split. So it would be very hard to kind of bring those together, so yeah that's a good point.

- Sorry, [inaudible]. I just really wanted to applaud you for [inaudible] well-being as well. There's more and more data coming up and if you work night shift all the time, you probably have some [inaudible] as well.

That's a huge statement that [inaudible] then to look at well-being factors as well and then culture.

- Right. Yeah, culture I think is going to be really important also, like, facility support for stuff, like, just being able to work the night shift because there's a lot of things that make it hard to live that life. Because I think that, like, in a fatigue researcher's perfect world, somebody would work the night shift all the time and it's, like, well, like, you have to drop your kids off at this time and then, like, this happens and what about that birthday party?

Like, it's really hard to, like, live a, like, a life that's kind of centered around, like, working the night shift, you know, with everything else that goes on. So are they ready to say, "Oh, you need, like, you need to push off your first day of the week one day because this is going on." They should be willing to do that, so yeah.

- Well done.

- Thanks guys for being patient.