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2018 NCSBN Scientific Symposium - Education: The Influences of Nursing School Characteristics on NCLEX Pass Rates: A National Study Video Transcript

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Event

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Presenter

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- [Tamara] So, thank you. And I'm Tamara Odom-Maryon as they said, and along with my colleagues, Lori Bailey and Solmaz Amiri, who are also from WSU, College of Nursing.

We're here to share our results on the influences of nursing school characteristics on NCLEX first time pass rates. And it's results from a national study. This study was funded through a grant from NCSBN, and I'd like to thank them for those funds, it wasn't possible without them. So, just as a quick overview I'm going to talk a little bit about background, what the problem is, what our research questions were, the approach that we took to answer those questions, share a little bit about results, discussion, and then implications around those results.

So, NCLEX pass rates have been used as a performance outcome for many years, accreditation requires that you need to be at or above 80%. Most schools now are setting internal benchmarks like 90% or 95% to compare themselves to other schools. And most of the interventions that have been put in place around 2011, 2012 were to address...addressing low NCLEX pass rates were to address raising admission requirements and including standardized exams throughout their curriculum.

But there really weren't a lot of studies, and haven't been a lot of studies looking at the impact of institutional characteristics on NCLEX pass rates. So, that brought to the forefront the need for a study looking at that. And it's important to look at institutional characteristics, because they impact the development of evidence-based policies. And by institutional characteristics, I'm talking about things like faculty credentialing, faculty to student ratios, cohort size, percentage of students working in your programs.

And based on a literature review that we did in 2015, it was clear there were a few studies documenting the associations between institutional characteristics and NCLEX pass rates. And those studies that were

described were usually based at a single program or were done with a couple of programs that were all part of a larger group.

So, there was some affiliation, and they focused on either one or two institutional characteristics, but they didn't have a whole series of them. So, we decided we needed to do a national study among nursing programs that was needed so we could examine current practices related to institutional characteristics, and examine what associations exist between those characteristics in first time pass rates.

The questions that we asked were, what's the relationship between faculty credentials and pass rates? Are didactic and clinical faculty student ratios associated with pass rates? Is the use of standardized tests associated with pass rates? And, are the number of semester and quarter hours in individual didactic and clinical courses associated with pass rates? So, our approach was, at that time there were 2,093 nursing programs in the United States, and unconsidered eligible nursing programs, those that offered either an ADN, BSN, or a diploma program or any combination of those.

And so, we searched program websites for program administrators, names and emails at those 2,093 organizations, and that's who we sent the survey to. Then we got the 2014 first time pass rates by looking them up on state boards of nursing websites. So, then we conducted the study during 2015-2016 academic year, and we used stratified sampling.

So, we grouped schools according to their pass rates being at or above 90, between 80 to 90, and below 90, and then we deployed our survey methods within each of those stratum to try to get a balanced number of schools within each of those groupings.

And we used a mixed mode approach over a 10-week period. So, we initially sent an introductory letter to the program administrators that included the URL to the survey as well as a responding access code. And then we followed that up with a postcard that had the URL, and then we sent up to three emails that included the URL and response code. And if we didn't get a response by that time, then we sent a paper copy with a self-addressed stamped envelope, and then followed that up with another postcard on email, and I think your letter at the end.

And any survey that we got within 10 weeks' time, we included. So, we developed an instrument that had 30 questions on it, and to establish content validity around that instrument, we had an expert panel of 5 experts review the survey questions to be sure they were complete and comprehensive.

And then we piloted the survey with 10 programs to be sure that wording of the questionnaires was accurate. And then those 10 programs were still included in the survey. And so, we looked at the 30 questions over from 5 different areas, so they were attributes about the institution, requirements around admission, requirements around program and graduation, curriculum and faculty. So, the institutional things that we asked about were, were they rural or urban?

Public versus other accreditation, yes or no? Summer classes offered. Semester and quarter systems. Cohort size. The percentage of students working more than 20 hours a week at the schools, and whether they offered assistance to non-native English speakers. We looked at cumulative prerequisite and science GPA is required for admission, whether there was a pre-admission standardized exam required, CNA training, interviews, letters of recommendation.

We looked at course grades in terms of the progression through the program, if there's a minimum passing course grade, the number of times you could repeat a course, the number of courses that you could repeat. We looked at whether there was standardized exams tied to progression, and whether there was an exit graduation exam.

We asked about if they had an integrated curriculum, so especially content threaded throughout the semesters. We asked about use of simulation, and if they had simulation, the number of hours that they were swapping out for clinical hours. For faculty attributes, we looked at number of students per didactic faculty, per clinical faculty, the percentage of courses taught by doctorally prepared faculty, faculty with specialty and certification, or specialty certification I should say, or a nursing education certification.

And then lastly, we looked at the percentage of full-time faculty. So, for the methods that we used, descriptive analysis. You'll see we're presenting things in terms of school, grouping schools below 80% and at or above 80%. And I did look at all of the analyses looking at those three categories, so greater than 90, 80 to 90, and less than 90.

And we also looked it as a continuous outcome. But the results from those analyses were so similar and didn't add anything new using this simpler presentation that ties closer to what accreditation uses, so we opted for this presentation. We did both univariable and multivariable analyses, so we use multilevel modeling to examine the association between NCLEX first time pass rates with these institutional characteristics using a random intercept model with an unstructured covariance matrix.

So, that basically allows us to account for correlation among schools within the same state. And then, continuous attributes like cohort size or percentage of full-time faculty, and were modeled as continuous measures, but we break them into logical groupings for presentation. So, we looked at missing data patterns to be sure the assumptions required held, and ultimately our goal was to take all of the significant univariable results and put them into one multivariable model, because that was really what would make this study different.

So, we had a really good response rate, we felt for this kind of research, 40% of the schools or 832 schools responded, that's probably a lot to do with the fact that we invested the time to look up a real person at each of the programs. Twenty five percent of the schools had passed first time pass rates in 2014 below 80%, 35% had first time pass rates above 90%, and 40% were between 80 to 90.

In terms of characteristics of those 832 programs, about half were rural, just under three fourths were from public, were public organizations, 94% of them were accredited, 92% of them were on semester systems, half of them conferred ADN degrees, and 41% conferred BSN degrees.

So, this is that same figure I showed you earlier and the things, the attributes highlighted in yellow are the factors that we found associated with NCLEX pass rates above 80%. And I'm going to go through now and show you the direction of the association between each of these characteristics and pass rates.

So, we'll look at public versus private, semester versus quarters, cohort size, standardized exam tied to the admission requirements and progression, as well as number of students per didactic faculty and percentage of full-time faculty. So, just to get oriented with this graph, because I'm going to use the

same presentation for all of the outcome, so I'm showing you the percentage of programs with first time pass rates at or above 80%, broken down by the attribute of interest, so that's organization type here.

So, there's 545 schools that were public institutions, 215 reported as other. And among the 545 public schools, 76% of them had first time pass rates at or above 80% compared to only 69% of the schools that were in the other category. So, that translates into an odds ratio of about 1.5, which means your odds of a first time pass rate is 1.5 times greater if you're from a public school compared to other.

And the confidence in [inaudible] there, but other includes private not-for-profit and private for-profit. There were only 36 private for-profit colleges, and I recognize there's probably a lot of people in this room who may, and myself included are not sure whether those should be grouped together, and our intention was to look at them separately, but we just didn't have the sample size.

And in honesty, when I left out this 36, there were no differences in the results for the private not-for-profit schools, so I felt in fairness to that group we should include their responses. So, that's that. Semester versus quarter, 75% of the schools on semester systems had first time pass rates above 80% compared to only 65% on quarters, that translates into an odds ratio of 1.7.

I've cautioned you too much about this finding because there's not very many schools on quarter systems, but it was significant by itself. Increasing admission cohort size was actually associated with first time pass rates above 80%.

That was a little surprising to us. But schools with 51 to 75 students in a cohort, 82% of them had first time pass rates above 80%. Seventy eight percent of the schools with more than 75 students in a cohort size had first time pass rates above 80%, compared to only 72% and 61% of the schools with cohort sizes of 50 or less.

So, that translates into an odds ratio of about 1.1, and that's the odds ratio associated with every increasing cohort size of 10 students. A similar kind of thing for a ratio of didactic faculty to students, the larger the number of students per didactic faculty, the greater the odds of having a first time pass rate above 80%.

So, the only thing I would caution you again here is where there's a small number of schools that have more than 50 students per didactic faculty. But nonetheless, that does translate into an odds ratio of 1.2 and about 85% to 89% of the schools with more than 50 students having first time pass rates above 80% compared to only around 73 with less.

In terms of full-time faculty, the increasing percentage of full-time faculty was strongly associated with having first time pass rates at or above 80%. So, 73% of the schools that had more than 50% of their faculty, 50% to 75% of their faculty full-time had first time pass rates above 80%, and 80% who had more than 75% of their faculty full-time had first time pass rates, compared to only 69% of those with less than 50%.

In terms of use of standardized exams or requiring it for admission, so requiring the standardized exam was actually associated with lower first time pass rates. So, 85% of the schools that did not report using

or requiring a standardized exam actually had first time pass rates above 80%, compared to only 73% of those that did.

That translates into an odds ratio of 2.14. Same thing for standardized exams for progression requiring that 79% of the schools that did not report requiring that actually had first time pass rates above 80% compared to only 73%. So, when we put all seven of those characteristics into this multivariable model, the advantage to that is you kind of shake out the variables which are noise and highly correlated with other things, so now you find what are the strongest factors associated.

And so what we found was that the most highly associated factors, the percentage of full-time faculty, and so the odds ratio in this multivariable model is 1.12, associate it with an increase of 10% of faculty. Not requiring a standardized exam for admission was the second strongest factor associated.

And then public schools was the third factor. So, let's drill down into some of the explanations. And you heard Dr. Spector suggest some very plausible ideas about the association between public schools and higher first time pass rates. Being a number person, I kind of come at it from how the numbers might be coming into play here.

I know that public schools have larger admission cohort sizes, so 49% of the schools that said they were public had more than 50 students. And I think we can think about how pass rates for schools with smaller cohort sizes are going to be more heavily influenced by individual student performance.

And I see a lot of people shaking their heads, but, you know, just to put it in perspective in terms of simple numbers, if you think in terms of you have a school with 10 students and a school with 100 students, and if you were looking for a pass rate of 90% in this...to be above 90% in the school with 10 students, you can't have any students not pass. But in the cohort size of 100 students, you can have 9 students who don't pass, so there's just not a lot of wiggle room for those schools with smaller cohort sizes, so that's a definite drawback to trying to model the school's pass rate versus individual or student level data.

In terms of admission and progression criteria, the association between not using standardized exams for pre-admission and lower first time pass...or using standardized exams and lower first time pass rates, I have kind of two thoughts on that. One is that, at the time this study was done, we were asking about, and so we're looking at 2014 pass rates and we're asking about, what did you have in place in 2011 and 2012?

And that was right around the time where there was a lot of pressure being put on programs to put something in place to address the declining pass rates that we were seeing. And so, at that time the schools that were performing above the benchmarks may not have needed to put anything into place, and so that may be one thing. The other thing is that while the interventions may have been put into place in 2011 and 2012, they didn't have time to really impact the pass rates in 2014.

So, that's another thing that could be going on there. Consistent with the work of Longbach, we did not see associations between higher first time pass rates and the education levels of the faculty. We did see a very strong association between the percentage of full-time faculty and higher first time pass rates.

So, limitations of this study, there is a possibility of recall bias, we're asking the administrators to remember what happened, but most schools have pretty good records around this kind of stuff because it's required for accreditation. I do think that while most of the studies that were in the literature, that prompted us to do this institutional characteristics level study, most of those studies did not... only looked at student-level data.

We kind of had to do the reverse here, and we only looked at institutional-level data, and I really think that, sort of in line with the keynote speaker's address is that the right analysis has to bring together both those things. So, we really need to be looking at a student's information, did that student pass the NCLEX, yes or no, if that's going to be the outcome.

And then what are the attributes of the institution that that student went to? And if that's going to be the strongest way to answer this question. And so, in terms of future research, I think there's really a need for that longitudinal study, bringing both those types of data together, but that would require sharing of a lot of information, and we heard a little bit about the challenges, but I do think it would be worthwhile.

We need more recent data to capture the impact of these changes. We need multiple years of data, and you heard Dr. Spector talk about a five-year study that's going on by NCSBN, and I think getting those results and comparing them to these will be really informative. And then I think we could look at other additional student attributes.

And implications for administrators and leaders are that these find it's important to compare their schools' institutional characteristics to a large national sample so that we can look at whether or not we should be driving change around these breakdown. So, for instance when I look at the sample of responses among this study, 38% of the programs reported half or more of their students working more than 20 hours a week.

And is that really where we want to be at with the students who are in our programs? And is there something that we can do to drive change around this so that students aren't coming in working so many hours, because that's going to drastically influence their learning abilities or opportunities. And 57% of the programs reported they don't provide assistance for non-native speakers of English.

And again, you know what I think we should be thinking about is that really where we want to be at as a group? And then doing these kinds of comparisons I think it'll align in standardized data collection efforts, so that if we do start sharing more information, it'll strengthen the future studies. So, with that, I will say that the results from this survey and tables of every question that we asked broken down above and below 80% are available now in the October issue of *The Journal of Nursing Regulation*, so you have access to all that information.

And I guess we're going to save questions for the panel, but I'm happy to speak with anybody. - [Female 1] [Inaudible]- Okay. So they're saying that we have time for a few questions if anyone has questions I think either for Dr. Spector or I would be fine. If you didn't hear the question, it was to address the fact that there's a lot of pressure from the companies that produce these standardized tests to hire on enough faculty to be able to cover their content in the curriculum and that a lot of times that means you have to hire on urgent faculty and people who don't have the training.

And if I didn't summarize your response... Go ahead. - [Female 2] I think it's the companies that help you expand the student population.

- Oh, the companies that help you expand the student population, so... - [Female 3] Thank you again. I don't know if we're on. But I think what you're doing is really reinforcing where nursing education has to go with quality... - [Male] There you go.

- Thank you. I don't know if this one's working. But anyways, I think what jumped out of me in your graphs were the correlation between higher cohort size and success on NCLEX. I think going back in nursing education, we were always taught, you know, small groups, small didactic, small theory, small cohort, and yet your research is showing differently.

And I think that's kind of exciting in a lot of ways because I know nursing is keeping a lot of universities and colleges afloat financially. But I just want to know your reason why you think that is.

- So, some of it I think is it's this correlation among common things, public schools have higher cohort sizes. The ratio of didactic faculty to number of students is related to cohort size, so they're all tied together, and maybe measuring one common trend or theme, and so in the multivariable analysis what remained was public schools.

And so, I think we need to go at it from sort of the direction that Dr. Spector is thinking about, is so what is it about public schools that are different is one way. The other thing is I do think we really have to think about the issues of the schools with smaller cohort sizes are going to be more heavily influenced by a tough test year or by students.

You know, there's without a doubt it can't be all just about the institution, it's got to be also about the student. And so, there's just that need for doing an analysis that looks at both student level data as well as organizational level attributes. -

[Female 4] Hi, I think I really enjoyed your presentation, and I appreciate you or your consensus or comments about why you think some of the data that may have appeared a little bit different as to why it was different, I appreciate that. Now in terms of the project, did you... I was wondering if it would be interesting to look at those that schools whose pass rate fell below the 80% to see if it matches up to what they perceive would be the concerns or the problems as to why they were there, if it'd matched up with this.

The other thought was, and I've just kind of thought about this and spoke with it just informally in terms of, we look at first time pass rate, but it would be interesting, to me anyway, to look at those students that pass second time within a certain period of time. And because there are many psychological factors, maybe factors that can contribute to being unsuccessful that initial time.

But I thought it would be interesting because we've had some issues where we've had some schools that have loss that did not make the NCLEX pass rate, and because of that, they lost their approval by the board. And many times it's in our historically black colleges and universities, where the resources are very limited.

- That's interesting. I don't...you know, I think that is an excellent suggestion to think about looking at whether it's qualitatively or quantitatively the schools that fell below 80% in the year that we're looking at and to see what their perceptions of what was going on and how does that align with what we're seeing?

We were surprised really by how similar really the institutional characteristics many of them didn't influence whether you were above or below 80%, whether you were in the 80 to 90, or above 90. So, just suggests that there's a lot related to the student. Yeah, in terms of the not using first time pass rates but maybe second time pass rates, that's a little harder to get.

I know we try to get that data at Washington State, and you can get how many times the students take, and did they eventually pass it? But it's a little harder to get the results for that, so...- [Female 6] Yeah, one of the things, and I'm sharing with Montana, and we have a lot of small, rural schools where their max number is 20 and less, you know, we have some of our native schools that may have 5.

And so, we're really trying to figure out how to support those schools and help them. One of the issues is timed NCLEX, that we're talking about like we don't have a regulation about timed NCLEX, but we're talking about, what would that look like? And the other question I have is, the recommendation for a full-time faculty in the earlier session, one of the discussion was so many nurses are going for advanced degrees, we're losing the bedside nurse, so how do we balance this in a shortage world, especially rural areas where everyone's looking for a director of nursing for their small schools, you know, a director of education.

How do we share that a bit you know?

- Yeah, that's a very good question. And I'm opening that up to this whole group, because that's so outside of my comfort zone. But I'm sure there are a lot of people in here who could really speak to that. And I don't know if we do we need to move to the panel session, I have no idea. - [Female 7] We'll probably talk about one more.

- Okay. - [Female 8] I haven't got a question, but I hope it's okay to make a comment. I'm one of five of us who are visiting from New Zealand. I'd just like to say how fascinating the two presentations have been, and how useful for us. Although we don't use NCLEX, both of you have contributed information which resonates so well with what it is that we do, the challenges that we have and the questions that we have around accreditation, monitoring, reporting and so on.

So, I'd just like to thank you. And it's really great to see what the commonalities are across education systems that is so very different.

- Yeah, that's fascinating.