

RESEARCH BRIEF:

Evaluating the predictive power of ATI's 2010 RN Comprehensive Predictor



Decisions made regarding students' readiness to take the NCLEX have a very real bearing on the future of both students and the programs from which they graduate. Recognizing this fact, programs frequently turn to standardized assessments such as Assessment Technologies Institute's (ATI) RN Comprehensive Predictor as a source of objective information about students' preparedness for the NCLEX. The research reported here documents the utility of the 2010 RN Comprehensive Predictor in predicting students' outcomes on the 2010 NCLEX.

INTRODUCTION

Although preparation for NCLEX is a primary goal throughout any nursing education program, in the final period prior to graduation, determining students' readiness to sit for the exam and identifying needs for remediation are of paramount concern. For assistance in these decisions, many institutions have chosen to implement predictive testing at the close of the program. ATI's 2010 RN Comprehensive Predictor (RN CP) is one such assessment; aligned with the NCLEX blueprint and providing both percentage-correct and probability-of-pass scores, as well as a list of topics to review, the RN CP is a powerful tool for assessing students' readiness to take the NCLEX.

Institutions wishing to use the RN CP as an indicator of students' readiness to take NCLEX have a vested interest in how accurately it is able to predict NCLEX outcomes. And indeed, the Standards for Educational and Psychological Measurement also outline the responsibility of the test author to provide evidence of the quality of the predictions made by an assessment, when such predictions are the stated goal of the assessment (AERA, 1999). It is the intent of Assessment Technologies Institute to provide documentation to support the most common inference made from the RN CP test scores; namely, the probability that an individual student will pass the NCLEX.

As such, the following research questions are explored in this paper:

- *At what rate do students taking the 2010 RN Comprehensive Predictor and pass the 2010 NCLEX?*
- *How well do scores on the 2010 RN Comprehensive Predictor predict outcomes on the 2010 NCLEX?*
- *How does the Probability of Pass score on the 2010 RN Comprehensive Predictor predict actual pass rates at intervals across the score continuum?*

METHODOLOGY

In order to obtain actual NCLEX outcomes for students taking the RN CP, an opt-in question was included at the end of the assessment. Students were informed of the purpose of the study and asked to grant or not grant permission to ATI to contact their nursing program to obtain their NCLEX outcome. Between April 20, 2010, and November 14, 2012, 102,329 students at 1,015 administering institutions answered "yes" to this opt-in question. The data were filtered to include only first-attempt RN CP scores, and also to include only institutions with at least 30 students agreeing to participate. The contact of record at each institution (typically, the director or dean) was invited to participate in the study and provided a list of consenting students. The institutional qualification of 30 or more participating students was made under the assumption that fewer than 30 students participating in 2 years indicates a

possible irregularity in administration or consent patterns.

Eighty programs provided first-attempt NCLEX outcomes for 7,126 students who also had first-attempt 2010 RN CP scores available in the ATI database. Table 1 shows the distribution of programs and students by program type, while Table 2 shows the distribution of programs and students by geographic region. Of the 7,126 students contributing data, 5,196 (72.9%) were female, 725 (10.1%) were male, and 1,205 (16.9%) chose not to disclose their gender.

Table 1. Number of programs and students by program type.

Program Type	Programs (n)	Students (n)
ADN	53	4060
BSN	23	2837
Diploma	2	132
Other	2	97

For the each examinee, two types of scores were available on the RN CP: a percentage correct score, and a probability of pass (PP), which is the student's probability of passing NCLEX based on the expectancy table developed for the assessment (ATI, 2010).

In order to answer the first question, regarding NCLEX pass rates, a comparison of reported pass rates in the sample was compared to the national pass rate reported by NCSBN. In

Table 2. Number and percent of programs and students by geographic region.

	Programs		Students	
	n	%	n	%
I. CT, ME, MA, NH, RI, VT	3	4%	428	6%
II. NY, NJ	6	8%	457	6%
III. DE, MD, PA, VA, WV, DC	13	16%	1119	16%
IV. AL, FL, GA, KY, MS, NC, SC, TN	14	18%	1014	14%
V. IL, IN, OH, MI, MN, WI	12	15%	1189	17%
VI. AR, LA, NM, OK, TX	7	9%	911	13%
VII. IA, KS, MO, NE	6	8%	661	9%
VIII. CO, MT, ND, SD, UT, WY	3	4%	255	4%
IX. AZ, CA, HI, NV	10	13%	862	12%
X. AK, ID, OR, WA	6	8%	230	3%
Total	80	100%	7126	100%

order to evaluate the predictive power of the RN CP, a logistic regression analysis was performed predicting first-attempt NCLEX outcome from RN CP percentage correct score. Finally, in order to evaluate the final question, how the probability of pass score relates to actual pass rates across the score continuum, probability of pass scores were used to group students into deciles, and the observed pass rates for each group were compared with expected.

RESULTS

Comparison of NCLEX pass rates

The answer to the initial question of interest, *What is the first-time NCLEX pass rate for students taking the RN Comprehensive Predictor?*, is most directly reported as 91.9%, as 6,550 of the 7,126 examinees were reported as passing on first attempt. In order to more critically evaluate this total-sample pass rate, the data were dis-aggregated by year and program type to provide a more granular comparison to NCLEX pass rates reported for the same period. It should be noted that this disaggregation is by date of taking the RN CP, as this is the data available to ATI; accordingly, there is some lack of precision in the comparison to NCLEX pass rates by year, as examinees taking RN CP late in one calendar year may well have actually taken NCLEX in the following year. Nevertheless, Table 3 provides ADN and BSN pass rates for the years 2011 and 2012, both for the study sample and the

national data reported by the National Council of State Boards of Nursing (NCSBN); due to the small sample of examinees in the dataset taking the RN CP in 2010 (n=7), pass rates are not reported. Likewise, Diploma and "Other" program types are not reported here due to the small number of programs and examinees participating.

Table 3. First-attempt pass rate (%) in the 2010 RN CP sample and nationally, by program type and year.

Year	Program Type			
	ADN		BSN	
	Nat'l	Sample	Nat'l	Sample
2011	87.0*	89.2	89.1*	92.3
2012	89.3 [‡]	93.4	91.7 [‡]	94.3

Source: NCSBN.org, 2011*, 2012[‡].

RN Comprehensive Predictor predicts NCLEX

In order to evaluate the ability of the RN Comprehensive Predictor to predict first-attempt outcomes on the NCLEX, a logistic regression analysis was performed. Model fit was good ($\chi^2=826.66$, $p<.001$ with $df=1$), indicating that the RN CP is able to reliably distinguish between those who pass NCLEX on the first attempt and those who fail. Exp(B) for the RN CP variable was 1.185, indicating that for every increase of one point in RN CP score,

the odds of passing the NCLEX increase by a factor of 1.185. Put another way, an examinee with a score of 90 on the Comprehensive Predictor would be nearly 12 times ($10 \times 1.185 = 11.85$) more likely to pass NCLEX on the first attempt than would an examinee with a RN CP score of 80.

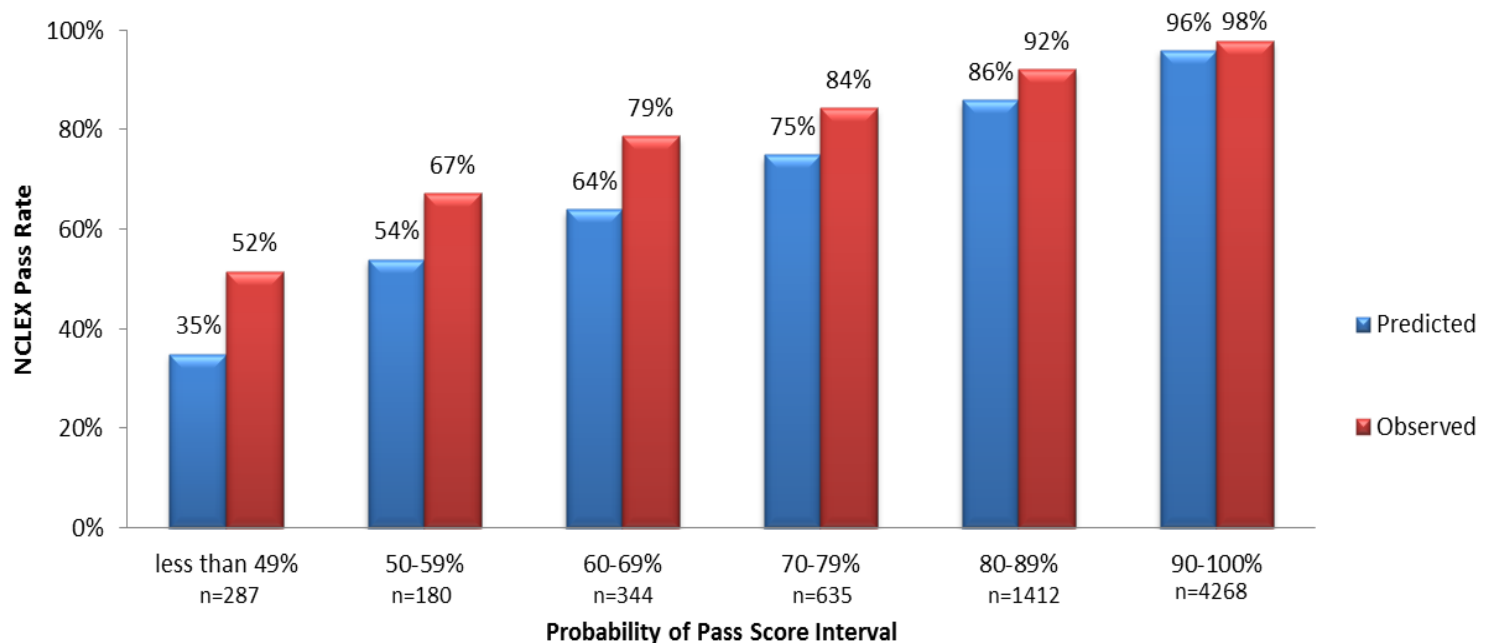
NCLEX pass rates by RN CP score interval

In order to further evaluate the performance of the Comprehensive Predictor across the score continuum, the predicted pass rate was calculated for each RN CP Probability of Pass decile and compared to the observed pass rate. The predicted pass rate for any group can be calculated as the mean of the predicted probability of pass scores for the group. Figure 1 shows the comparison of predicted and observed pass rates for each PP decile; deciles below 50% were collapsed due to the small sample in each.

CONCLUSION

These analyses of ATI's RN Comprehensive Predictor assessment show that it can be a valuable source of information about students' readiness to take the NCLEX. Comparison of the study sample pass rates with NCSBN national database pass rates suggests that users of ATI's RN CP pass at a slightly higher rate than the national reported

Figure 1. Observed NCLEX pass rate by RN CP Probability of Pass score interval



pass rate for both ADN and BSN programs types. Although it is beyond the scope of this study to comment on the range of factors impacting program pass rates, for more information, the reader is directed to the ATI research briefs *Evidence-based curriculum design – Statistically linking CARP usage levels and nursing student attrition* (ATI, 2012), and *Using RN Content Mastery Series test data to identify student needs* (ATI, 2012).

Logistic regression analysis of RN CP scores predicting NCLEX outcome shows that the assessment reliably predicts first-attempt NCLEX outcome; as such, it may be a useful tool for program faculty making judgments regarding students' readiness to take the NCLEX. It is important to note that all scores included in the current study were first-attempt RN CP scores. Future work will explore the relationship between re-test scores on the RN CP and NCLEX outcome; the time interval between initial RN CP attempt and re-testing, the nature of the remediation, and the overall performance profile of students across the curriculum should be taken into account when interpreting retake scores. Indeed, as with any assessment, and for all examinees, information from the RN CP should not be relied upon as a sole indicator of readiness for NCLEX; rather it is a helpful, standardized metric to supplement and confirm the judgment of faculty who are familiar with the performance of students throughout their nursing program.

A comparison of the predicted and observed pass rates for deciles across the RN CP score continuum show that students consistently pass at a higher rate than expected based on their RN CP score. This pattern of performance indicates that the Comprehensive Predictor is performing another important intended function – that of raising the awareness of students to their odds of passing NCLEX at their current level of preparedness and providing diagnostic information in order to assist them in focusing their review efforts with maximum effectiveness. Because the RN

... the [2010 RN
Comprehensive Predictor]
reliably predicts first-
attempt NCLEX outcome.

Comprehensive Predictor Probability of Pass score is developed to give an examinee's expected NCLEX outcome *if the test were taken without further preparation*, it is not surprising that examinees do actually pass at a slightly higher rate than expected; they continue to study with the express purpose of "beating the odds," and the diagnostic information they receive from the RN CP helps them to do just that.

ACKNOWLEDGMENT

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REFERENCES

- American Educational Research Association, American Psychological Association, & National Council on Measurement in Education (1999). *Standards for Educational and Psychological Testing*. Washington, DC: AERA.
- Assessment Technologies Institute. (2010). *RN Comprehensive Predictor 2010 and NCLEX-RN readiness*. Stilwell, KS: ATI.
- Assessment Technologies Institute. (2012). *Statistically linking CARP usage levels and nursing student attrition*. Leawood, KS: ATI.
- Assessment Technologies Institute. (2012). *Using RN Content Mastery Series test data to identify student needs*. Leawood, KS: ATI.
- National Council of State Boards of Nursing (2011). 2011 NCLEX pass rates. Retrieved July 28, 2013, from https://www.ncsbn.org/Table_of_Pass_Rates_2011.pdf.
- National Council of State Boards of Nursing (2012). 2012 NCLEX pass rates. Retrieved July 28, 2013, from https://www.ncsbn.org/Table_of_Pass_Rates_2012.pdf.

If you have any questions regarding this paper or its findings, please do not hesitate to contact us at: aticommunications@atitesting.com.