NCSBN Focus

NCLEX Pass Rates: An Investigation Into the Effect of Lag Time and Retake Attempts

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The demand for qualified nurses is increasing.[1] A strategy for meeting this demand is for qualified nursing candidates to enter the workforce as soon as possible. To assist with this strategy, the National Council Licensure Examination (NCLEX) examinations (NCLEX-RN and NCLEX-PN) are offered almost daily, and candidates' results are often released within days of examination completion. Although candidates can schedule their examination as soon as they receive an authorization-to-test letter, some candidates delay in taking their NCLEX examination, and some candidates who have registered and paid never take the NCLEX.[2]

A review of the literature revealed few articles and research other than prior research conducted by the National Council of State Boards of Nursing (NCSBN) on reasons why nursing candidates may delay in taking the NCLEX. A further review of the literature identified many articles on academic and nonacademic variables that predict success on the NCLEX. The academic variables mentioned in these studies included grade point average in nursing and science courses, clinical nursing grades, predictor test scores, and standardized test scores.[3–6] Nonacademic predictors of success on NCLEX that have been noted are English as a primary language spoken at home, lack of family responsibilities, decreased test anxiety, increased self-esteem, lack of emotional distress, and self-perceived competence.[7,8] In addition, one study noted that motivation to succeed, family support, and NCLEX preparation were related to success on NCLEX.[9] Finally, anecdotal information from boards of nursing suggests that fear of failure combined with some jurisdictions allowing nurses to work under a temporary permit may decrease the motivation to take the NCLEX. All of the nonacademic variables seem to be plausible explanations for why some eligible candidates delay or do not take the NCLEX.

This article will investigate the relationship between passing the NCLEX and the delay or lag in taking the NCLEX. A discussion of the possible reasons for the relationship is presented.

Method

Participants

Data from the NCLEX-RN and NCLEX-PN examinations from July 1, 2006, to June 30, 2008, were analyzed. During this period, 176,539 RN examinations and 67,849 PN examinations were administered. The average age for RN candidates tested during this period was 30.7 years (SD = 8.5 years) and for PN candidates was 31.5 years (SD = 9.1 years). Most candidates were female (RN = 84.6%, PN = 86.4%). The most commonly reported ethnicity among candidates was white (RN = 57.7%, RN = 54.2%). The next largest ethnic group among RN candidates was Asian other (17.2%), whereas African American was the second largest ethnic group for PN candidates (21.2%).

Data Analyses

A moderated logistic regression was used to ascertain the effects of the number of retake attempts and delay or lag time on pass rate. In the present study, candidate's pass/fail status was used as a criterion variable in the regression equations. Candidates' lag time (the number of days between eligibility date and the actual test date) and number of retake attempts were used as main effect variables. To investigate the moderator effect of number of attempts on delay pass rate, an interaction term formed by the 2 main effect variables was also entered into the regression model.

Regression models were run separately for RN and PN data using the Statistical Analysis System software (SAS, Cary, North Carolina).[10] For each regression model, the main effect variables (lag time and number of attempts) and the interaction term were entered simultaneously. The main effect variables were centered before forming the interaction term to reduce potential issues with interrelatedness of predictor

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variables.[11] Centering involves transforming raw score variables into deviation scores where variable means are set to zero. This technique helps minimize potential multicollinearity among regression variables due to scaling.

In the present study, a significant interaction would indicate that regression of the criterion variable (pass/fail status) on lag time varies as a function of number of attempts. This would support the presence of a moderator effect. A negative regression coefficient for the interaction term suggests that the effect of lag time on pass/fail status decreases as the number of retake attempts increases. Adversely, a positive regression coefficient for the interaction term shows that the effect of lag on pass/fail status increases as candidates' attempts go up. To provide a clear picture of the interactions, simple slopes of the interactions were calculated following the procedures delineated in Aiken and West.[11]

TABLE 1
Moderated Logistic Regression Results for the Effect of Lag Time and Number of Attempts on Candidates' Pass/Fail Statuses

Parameter	b	SE	Mean	P
RN examinations				
Model intercept	−1.178	0.00417	79636.40	<.0001
Lag time	0.013	0.000098	16189.79	<.0001
Attempts	0.834	0.00672	15408.27	<.0001
Lag X attempts	−0.003	0.000166	285.23	<.0001
PN examinations				
Model intercept	−1.654	0.00779	45115.88	<.0001
Lag time	0.019	0.000243	5883.48	<.0001
Attempts	1.222	0.0147	6917.55	<.0001
Lag X attempts	−0.008	0.000364	513.91	<.0001

Results

On average, RN candidates sit for the NCLEX 34.79 days (SD = 28.30 days) after becoming eligible. The mean lag time for PN candidates was slightly longer at 45.00 days (SD = 45.84 days). The average number of attempts for RN candidates is 1.14 (SD = 0.49) and 1.22 for PN candidates (SD = 0.67). Table 1 reports the results of the moderated logistic regression analysis, conducted separately for RN and PN examinations. In each regression analysis, the mean-centered variables of lag time and number of attempts as well as the lag attempts product term were entered into the equation simultaneously. In both regression models, lag time has a significant inverse relationship with pass/fail status (RN: $b = 0.013$, $p < 0.0001$; PN: $b = 0.019$, $p < .0001$). This suggests that pass rates tend to decrease as candidates' lag time increases. Similar results were found between number of repeat attempts and pass/fail status. RN data showed a significant inverse relationship between number of attempts and pass/fail status ($b = 0.824$, $p < .0001$). The same is also true in the PN data ($b = 1.222$, $p < .0001$). These results imply that pass rates decrease as candidates' number of attempts increases.

Before conducting the analyses, the authors hypothesized that different numbers of attempts will affect delay pass rates differentially. This hypothesis was indeed supported by the regression results, as indicated by the significant interaction terms in both models. The negative regression coefficient for the interaction terms (RN: $b = -0.003$, $p < .0001$; PN: $b = -0.008$, $p < .0001$) indicates that the relationship between lag time and pass/fail status is stronger at lower number of repeat attempts than at higher number of repeat attempts. A clearer picture of the form of the interaction can be seen with simple slopes of the interactions. For RN and PN examinations, separate simple slopes were calculated one standard deviation below and above the mean number of attempts. These simple slopes represent low and high number of retake attempts, respectively. This analysis shows that the slopes were steeper for candidates who have a lower number of attempts than those with a higher one. For RN candidates with low number of attempts, the slope was 0.014. The slope for their high-attempt counterparts was slightly flatter at 0.011. Results were similar for PN candidates. The slope for low-attempt PN candidates was 0.022, whereas that for high-attempt PN candidates was 0.015.

Discussion

Consistent with the delay pass rate study conducted previously, results of the present study indicate that pass rate is inversely related to lag time for both RN and PN candidates.[12] Overall, candidates were less likely to pass the NCLEX as their lag time increased. However, this relationship is moderated by the number of attempts on the NCLEX. Simple slopes of the moderator terms revealed that the lag time–pass rate relationship is stronger for candidates who have fewer NCLEX attempts than those with high attempts. It could be that candidates with higher attempts return to school, take preparation and more intense courses, or work as nonlicensed healthcare workers, which boosts their ability and self-confidence, thus enabling them to

pass. In addition, as time passes with the greater number of attempts, some of the initial factors affecting pass rates may decrease or disappear such as family responsibilities and lack of English proficiency. It is very likely that candidates' lag time before taking the NCLEX is not random. Perhaps candidates who felt unprepared for the licensure examination self-selected to take the test later in their eligibility period, as opposed to their more confident counterparts. Although NCSBN does not have direct data that measure candidates' motivation to delay taking the NCLEX after obtaining eligibility, the data obtained from an unpublished nonlicensure survey may provide some insight into the matter.

In 2004, NCSBN conducted a survey to investigate the reasons behind why some candidates who completed their nursing education and obtained eligibility to sit for the NCLEX never took the licensure examination.[13] Survey data were obtained from candidates who registered for the NCLEX in 2001 but had not taken the NCLEX as of December 2003. Two hundred seventy-one RN candidates and 86 PN candidates participated in the survey. For both the RN and PN groups, the most frequently cited reason for not taking the NCLEX was ''not confident in ability to pass exam.'' Table 2 lists the most frequently cited reasons for eligible candidates who did not seek licensure.

Conclusions

Based on results obtained from the present and previous studies, lag time is inversely related to candidates' pass rate on the NCLEX.[12] However, it is important to keep in mind that correlation is not the same as causation—a delay in taking the NCLEX does not cause the candidate to fail. While the relationship between lag time and pass rate undeniably exists, it may be explained by a third variable. As shown in the present study, the number of candidate attempts moderates the lag–pass rate relationship. In addition, there may be other factors (eg, candidates' perception of own preparedness) that contribute to candidates' decision to delay taking the NCLEX as opposed to taking it at the earliest opportunity.

It is important for readers to keep in mind that most candidates do pass the NCLEX on the first attempt. This is evident in the current NCLEX pass rate for US-educated candidates taking the NCLEX for the first time (RN: 88.3%; PN: 84.9%). As a result of a large percentage of candidates passing, the range of candidate attempts in the data is restricted. This restriction of range likely contributed to the small regression coefficient of the moderator terms in the regression models. Albeit small, the moderation effect of number of attempts is statistically significant. In addition, this significance is likely to be robust because of the large sample size.

Recommendations

Candidates who have been granted eligibility to take the NCLEX should be encouraged to schedule and take the examination earlier rather than later in the eligibility period for a variety of reasons, not the least of which has to do with obtaining the test date and time that best match their needs. A further delay can be avoided by not letting their authorization-to-test expire. In addition, unless the candidate is practicing nursing in some way, there may be decline in candidates' nursing knowledge, skills, and abilities if a long lag time exists between graduation and sitting for the NCLEX. However, if candidates do elect to delay taking the NCLEX, it could be related to lack of preparation. Nurse managers should provide materials to assist these candidates. If the reasons are test anxiety and lack of confidence, candidates can be helped by their mentors and preceptors to overcome these emotions through encouragement and practice. Although the results of this study

TABLE 2
Most Frequently Cited Reasons for Delaying or Not Taking the NCLEX Examination

	RN Candidates (n = 271)		PN Candidates (n = 86)	
Reasons[a]	US-Educated (n = 28)	Internationally Educated (n = 243)	US-Educated (n = 49)	Internationally Educated (n = 37)
Not confident in ability to pass the examination	25%	11%	27%	6%
General test anxiety	15%	6%	15%	4%
Not enough time to prepare	6%	18%	9%	15%
Registration or authority-to-test letter expired	15%	11%	14%	14%

[a]Candidates were asked to select all reasons that applied to their situations.

suggest that there is a relationship between delay in taking NCLEX and passing, it should be reiterated that a delay in taking the NCLEX does not cause a candidate to fail.

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