

## RESEARCH

# The Impact of Pharmacy Students' Remediation Status on NAPLEX First-Time Pass Rates

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Submitted June 2, 2012; accepted September 21, 2012; published December 12, 2012.

**Objective.** To determine whether there is a difference in pass rates on the North American Pharmacist Licensure Examination (NAPLEX) between students who did and did not require remediation for deficient course grades.

**Methods.** Student-specific data were collected regarding course grade deficiencies and completion of a comprehensive examination or course for remediation. Student-specific first-time NAPLEX performance data for the graduating classes of 2008, 2009, and 2011 were provided by the National Association of Boards of Pharmacy (NABP).

**Results.** A significant difference was found in first-time NAPLEX mean pass rates between students who did not need to undergo remediation versus those who did ( 97% vs 70%).

**Conclusion.** Students requiring remediation for deficient course grades had a lower pass rate on the NAPLEX compared with those who did not require remediation. The difference can be attributed to several factors and therefore further study is needed.

**Keywords:** remediation, NAPLEX, examination, assessment

## INTRODUCTION

Having a course remediation policy in place is a mandate of the Accreditation Council for Pharmacy Education (ACPE) 2007 Standard 19, which states that pharmacy colleges and schools “must produce and make available to students and prospective students criteria, policies, and procedures for academic progression, academic probation, remediation, missed course work or credit, dismissal, readmission, rights to due process, and appeal mechanisms.”<sup>1</sup> However, the ACPE is less prescriptive on the content of the standard, leading to an apparent lack of consensus among colleges and schools of pharmacy.<sup>2</sup> There is a paucity of published assessment data evaluating whether the goals of remediation are being met. The objective of this manuscript is to determine whether remediation for courses in the doctor of pharmacy program is associated with a lower pass rate on the NAPLEX.

All pharmacy educators struggle between balancing the public's trust as a line of protection from undereducated and incompetent pharmacists and their desire to help underperforming students succeed in their stated career goals. Boards of pharmacy nationwide use the NAPLEX to ascertain pharmacy students' competency.

Given the function of the NAPLEX in assessing outcomes of pharmacy education and the requirement of developing predictors of success, the underlying hypothesis prior to beginning analysis was that remediation status would be related to NAPLEX first-time passing rate. Data on remediation success rates from this study could be used to inform decisions made at Lake Erie College of Osteopathic Medicine (LECOM) School of Pharmacy regarding remediation policies and processes.

## METHODS

The research contained herein was submitted for review to the Human Protections Administrator (IRB chairman) and was determined to be exempt. Upon submission of the NABP Authorization to Release Information form, student-identifiable NAPLEX data were provided by the National Association of Boards of Pharmacy (NABP) for LECOM School of Pharmacy Students taking the test in 2008, 2009, and 2011 (2010 data were unavailable).<sup>3</sup> The NAPLEX first-time pass data were compared with the remediation data (which consisted of what students remediated and when) maintained by the school. The graduating student lists for 2008, 2009, and 2011 were grouped according to status (either remediated or non-remediated). The graduating student lists, consisting of 2 groups, had their respective NAPLEX status assigned as either pass or fail. The data was then de-identified and analyzed by

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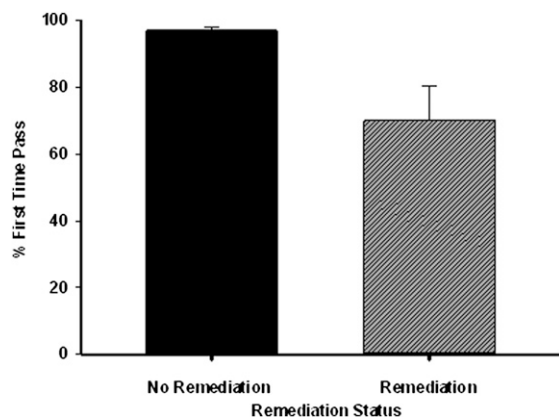


Figure 1. First-time NAPLEX passing rates of remediating vs non-remediating students in the class of 2008, 2009 and 2011.

remediator status. Students who withdrew from or were dismissed from LECOM School of Pharmacy were excluded from the analysis, as were students who did not sign the NABP wavier form. The data were analyzed for significance using the Welch's *t* test for unpooled variance<sup>4</sup> and plotted using Sigma Plot 12.0 (Systat Software, Inc., San Jose, CA) analysis and graphics package. Welch's *t* test for unpooled variance was used principally because the variance between the 2 student groups, described above, was not the same, thus use of the student's *t* test was inappropriate in this instance.

## RESULTS

Twenty of the 421 students included in the study had required remediation and 400 had not. Data were presented as plus or minus the standard error of the mean (SEM). The difference in the mean values of the 2 groups was greater than would be expected by chance; therefore, there was a significant difference between the 2 groups ( $p = <0.001$ ).

A clear difference was found in NAPLEX passing rates between students who had required remediation and those who had not (Figure 1). Data analysis yielded a mean passing rate among the non-remediation group of 97% ± 0.85% for the years included, while the remediation group had a mean passing rate of 70% ± 10.5%. It was not possible, given the sample size of the remediation group, to perform further subgroup analysis.

## DISCUSSION

Student remediation may be related to the first-time NAPLEX passing status. While the data were not entirely unexpected, the findings do shed light on the remediation processes in general. Remediations, by their nature, are intended to allow a student to repeat coursework where a grade of D or F has been achieved.<sup>2</sup> Allowing a student

to complete a course remediation, as LECOM and many other colleges and schools of pharmacy do, may not guarantee a complete grasp of the desired educational outcomes.

The lack of clarity surrounding the less than optimal outcomes (ie, first-time board failure) leaves educators struggling to ascertain the cause of examination failure. From an operational standpoint, this study reinforces the idea that greater attention should be paid to the remediation status of students. Feasibly, one could postulate that by modifying remediation policies, a college or school of pharmacy could directly impact NAPLEX pass rates. The ability to influence NAPLEX pass rates is an important topic not just for our students but for accreditation because review of graduates' performance on the NAPLEX is part of annual monitoring.<sup>5</sup> The current results will be used to determine whether a different approach to remediation should be taken; for example, eliminating remedial examinations and requiring a more structured and intensive remediation course for all students who do not pass.

The LECOM School of Pharmacy's remediation process includes an examination and a course. If a student earns a final grade between 60% and 69%, the student may take a comprehensive remedial examination. If the student passes the examination with a 70%, the student may progress. If the student earns a final grade of less than 60% in a class or if he or she fails the remedial examination, the student must enroll in a remedial course on the same topic offered during the summer. This course is designed based on the course coordinators' preference and usually involves self-directed learning with formative and summative assessments over several weeks.

A more rigid approach, in light of our data, may contribute to better first-time pass rates for students needing remediation. Several LECOM School of Pharmacy proposals have included a higher grade requirement to remediate the course as well as a higher grade requirement to successfully remediate the course and progress. The proposals, if implemented, will be assessed to determine if there is any effect on first-time NAPLEX pass rate.

In future research, we will investigate one reasonable explanation for remediation failure which is that it is the result of a deficiency in a student's logical thinking abilities. The deficiency defined as *formal operational thought* by Piaget,<sup>6</sup> may not be addressable by course remediation. While it is unclear what percentage of students would fail the NAPLEX due to less advanced levels of operational thought; remediation status as a surrogate for a Tobin's test of logical thinking<sup>7</sup> may not be an unreasonable supposition and could warrant further investigation. What is apparent is that, in general, students who remediate do worse on the NAPLEX than those who

do not require remediation. It would be interesting to determine the reason for the poorer performance and determine whether it is generalizable across different types of remediation approaches.

We will also attempt to: (1) determine whether repeating a year of pharmacy school is more beneficial than remediation in terms of NAPLEX pass rates, (2) establish whether the type of course failed impacts pass rates more than the number of courses remediated, (3) determine whether an altered approach to remediation would improve NAPLEX pass rates, (4) determine using subgroup analysis the particular reasons for NAPLEX failures, (5) determine using rank order analysis the effect of pharmacy school grade point average on first-time NAPLEX pass rates to develop more predictive measures of success, and (6) attempt to correlate prepharmacy coursework with first-time NAPLEX pass rates.

## CONCLUSIONS

Students requiring remediation at LECOM School of Pharmacy had lower NAPLEX pass rates than those who did not require remediation, and the underlying reason is unclear. Further work must be done to determine whether

there is a deficiency in these students' logical or critical thinking abilities or whether there is a deficiency in the remediation process itself. We will examine this and other predictors for success on the NAPLEX in the future.

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