

Predicting early nursing school performance in a BSN program: How do the ATI TEAS Version 7 preparedness levels predict RN CMS Fundamentals performance?

ATI's Test of Essential Academic Skills (TEAS) Version 7 is an assessment used to measure students' academic preparedness to enter a nursing program. It is used by nursing schools as one of the admissions criteria to select students for entrance into a nursing program. Many programs choose to adopt one of several performance level descriptors, known as academic preparedness categories, associated with the ATI TEAS Version 7 as a minimum score for admission. This analysis examines the relationship between the ATI TEAS Version 7 scores, specifically the academic preparedness categories, and early academic performance in a BSN nursing program as measured by ATI's RN Content Mastery Series (CMS) Fundamentals of Nursing 2019 assessments.

Introduction

The admissions decision process is important for both nursing faculty and aspiring students. For nursing faculty, the ability to evaluate prospective students' potential to succeed in nursing school is of paramount concern. Programs use a variety of admissions criteria to gain as much information as possible about applicants for use in the decision-making process. One common criterion is the ATI TEAS Version 7 assessment, published by Assessment Technologies Institute, LLC (ATI). The ATI TEAS Version 7 assesses students' skills in the areas of reading, math, science, and English and language usage. Examinees taking the ATI TEAS Version 7 receive separate scores for each of the four content areas assessed, as well as an overall composite score.

As an aid in interpreting and making meaningful decisions based on the ATI TEAS Version 7 scores, ATI has developed criterion referenced scoring standards called the academic preparedness categories that correspond to ranges of student performance on the ATI TEAS Version 7. The academic preparedness categories were developed through a standard setting process conducted with 20 nurse educators representing ADN, BSN, diploma, PN, and accelerated BSN program types from institutions of various sizes and types from across the U.S. For more detailed information about the cut score-setting process and the academic preparedness categories, the reader is directed to the ATI TEAS Academic Preparedness Level Summary (ATI, 2020).

Because the purpose of the ATI TEAS Version 7 is to help nursing schools identify students who are prepared to be successful in a nursing program, the early nursing school performance of admitted students is a key piece of evidence supporting its use. For this paper's analyses, the RN CMS Fundamentals 2019 assessment, part of ATI's RN Content Mastery Series 2019, was chosen as a measure of early academic performance in a nursing program. This criterion was selected because it provides a standardized point of comparison, as compared to first-semester GPA, which may be highly variable across programs.

Additionally, the RN CMS Fundamentals assessment has associated proficiency levels, which are frequently used to provide a convenient and interpretable measure of achievement. Like the ATI TEAS Version 7 preparedness levels, the RN CMS proficiency level cut scores were established by a panel of nurse educators. For more information on the details of the standard-setting process, please see the RN CMS 2019 National Standard Setting Study Report (ATI, 2020).

The following research questions are explored in this paper:

- What is the relationship between the ATI TEAS Version 7 scores and the RN CMS Fundamentals scores?

- What is the pattern of the RN CMS Fundamentals proficiency level achievement for students of differing ATI TEAS Version 7 preparedness levels?

Methodology

For these analyses, the first-attempt scores for individuals taking an RN CMS Fundamentals 2019 exam in BSN program between June 3, 2022, and May 1, 2023, were matched with first-attempt ATI TEAS Version 7 scores already in the system. Only those assessments marked as 80% complete and 30% correct, and with all four subsections of the ATI TEAS Version 7 completed, were included in the dataset. These selection criteria returned a final sample size of 3,018 student records spanning 177 nursing programs for analysis.

Eighty percent complete and thirty percent correct are standard filtering criteria that ATI applies, reasoning that an examinee making a genuine effort would be able to complete 80% of the assessment with at least 30% of the test items answered correctly.

Results

Relationship between the ATI TEAS Version 7 and the RN CMS Fundamentals scores

In order to examine the relationship between the ATI TEAS Version 7 and the RN CMS Fundamentals assessment, Pearson correlations were run for the four ATI TEAS Version 7 subscores as well as the composite score with the RN CMS Fundamentals score. All correlations are reported in Table 1.

Evaluation of the correlations in Table 1 suggests that the ATI TEAS Version 7 is a useful predictor of achievement early in a nursing program, as measured by the RN CMS Fundamentals assessment. Further, the ATI TEAS Version 7 total score has a stronger relationship with the RN CMS Fundamentals score than the individual subscores.

Table 1. Correlation of the ATI TEAS Version 7 subscores and composite score with the Fundamentals score (n=3,018)

| | Reading | Math | Science | English and Language Usage | Composite score |
|--------------|---------|------|---------|----------------------------|-----------------|
| Fundamentals | .353 | .328 | .329 | .327 | .413 |

All correlations significant at $p < .001$.

ATI TEAS Version 7 preparedness levels and the RN CMS Fundamentals proficiency levels

To evaluate the relationship between the ATI TEAS Version 7 preparedness levels and individuals' later proficiency level achievement on the RN CMS Fundamentals 2019, a crosstabs analysis was run to examine the distribution of scores in each ATI TEAS Version 7 preparedness category by the RN CMS Fundamentals proficiency levels. Table 2 displays the results of this analysis as the percentage of individuals within each ATI TEAS Version 7 preparedness level scoring at each RN CMS Fundamentals proficiency level. An examination of Table 2 reveals that, as individuals score in successively higher ATI TEAS Version 7 preparedness categories, the percentage scoring at higher proficiency levels on the Fundamentals assessment increases. Shading on Table 2 indicates the highest percentage of Fundamentals proficiency within each ATI TEAS Version 7 preparedness level for ease of visualization.

Table 2. Crosstabs of ATI TEAS Version 7 academic preparedness category by Fundamentals proficiency level (n=3,018)

| ATI TEAS Version 7 Academic Preparedness Levels | | Fundamentals Proficiency Levels | | | |
|---|-------------------|---------------------------------|-------|-------|-------|
| | | 0 | 1 | 2 | 3 |
| Developmental | % within category | 60.0% | 36.0% | 4.0% | 0.0% |
| | n | 15 | 9 | 1 | 0 |
| Basic | % within category | 25.2% | 52.6% | 22.2% | 0.0% |
| | n | 95 | 199 | 84 | 0 |
| Proficient | % within category | 10.3% | 40.1% | 46.4% | 3.2% |
| | n | 200 | 782 | 903 | 63 |
| Advanced | % within category | 2.5% | 28.7% | 59.9% | 8.9% |
| | n | 16 | 180 | 376 | 56 |
| Exemplary | % within category | 0.0% | 0.0% | 66.7% | 33.3% |
| | n | 0 | 0 | 26 | 13 |

Proficiency level 2 on the RN CMS Fundamentals assessment is a common benchmark among nursing programs. Using this proficiency level as a standard for “success”, it appears that achievement of the Advanced preparedness level or better on the ATI TEAS Version 7 is associated with a majority of students achieving “success” on the RN CMS Fundamentals assessment. However, a more common standard for programs using the ATI TEAS Version 7 is the Proficient level; Table 2 also shows that approximately 50% percent of students admitted with an initial ATI TEAS Version 7 score in the Proficient category achieve level 2 and above on the RN CMS Fundamentals assessment.

In order to more clearly illustrate the relationship between these common benchmarks on the two assessments, scores on the ATI TEAS Version 7 were dichotomized into “below Proficient” and “Proficient and above.” Similarly, scores on the RN CMS Fundamentals assessment were dichotomized into “below level 2” and “level 2 and above.” Table 3 shows the percentage of individuals at each ATI TEAS Version 7 level (below Proficient; Proficient and above) achieving proficiency on the RN CMS Fundamentals assessment.

Table 3. Crosstabs of Dichotomized ATI TEAS Version 7 level (Proficient and above) by Dichotomized Fundamentals Proficiency Levels (n=3,018)

| ATI TEAS Version 7 Preparedness | | Fundamentals Proficiency Levels | |
|---------------------------------|---------------------|---------------------------------|-------------------|
| | | Below Level 2 | Level 2 and above |
| Below Proficient | % within category n | 78.9% | 21.1% |
| | | 318 | 85 |
| Proficient and above | % within category n | 45.0% | 55.0% |
| | | 1,178 | 1,437 |

Because of the larger percentage of students scoring at the Advanced level and above who also achieve level 2 or higher on the RN CMS Fundamentals, the ATI TEAS Version 7 scores were also dichotomized into two levels on this basis (below Advanced; Advanced and above), and an additional crosstabs analysis of dichotomized ATI TEAS Version 7 and RN CMS Fundamentals scores was performed. Table 4 displays these results.

Table 4. Crosstabs of Dichotomized ATI TEAS Version 7 level (Advanced and above) by Dichotomized Fundamentals Proficiency Levels (n=3,018)

| ATI TEAS Version 7 Preparedness | | Fundamentals Proficiency Levels | |
|---------------------------------|---------------------|---------------------------------|-------------------|
| | | Below Level 2 | Level 2 and above |
| Below Advanced | % within category n | 55.3% | 44.7% |
| | | 1,300 | 1,051 |
| Advanced and above | % within category n | 29.4% | 70.6% |
| | | 196 | 471 |

A comparison of Tables 3 and 4 might make the use of the Advanced level as a BSN standard for the ATI TEAS Version 7 attractive. However, it is also important to consider that a large percentage of students with ATI TEAS Version 7 scores in the Proficient level do, in fact, go on to achieve level 2 or above on the RN CMS Fundamentals assessment. In light of these data, it seems especially important for programs to consider their applicant pool and admitted cohorts in terms of their expectations for incoming students and the support that the program provides to students in the ATI TEAS Version 7 Proficient category. Additionally, programs may benefit from considering the data here in conjunction with their own program-specific analysis of admitted students' ATI TEAS Version 7 scores and subsequent performance.

Conclusion

The magnitude of the correlation between the ATI TEAS Version 7 and the RN CMS Fundamentals scores demonstrates the usefulness of the ATI TEAS Version 7 as an indicator of preparedness for early academic success in a nursing program. Although it is ATI's position that selection into a nursing program should never be based on a single criterion such as the ATI

TEAS Version 7, the correlations presented here do support the use of the ATI TEAS Version 7 scores as a selection criterion in combination with additional information about applicants.

Additionally, the ATI TEAS Version 7 preparedness level data are a powerful complement to the established preparedness level descriptors and provide an enhanced picture of how students at various levels are likely to perform early in a nursing program. For programs choosing a preparedness level standard for use with the ATI TEAS Version 7, it is particularly important to consider expectations for early program academic performance, such as the RN CMS Fundamentals proficiency level achievement, and the support mechanisms that the program has available, in conjunction with the data presented here.

References

Assessment Technologies Institute, LLC. (2020). ATI TEAS Academic Preparedness Level Summary. Author: Leawood, KS.
Assessment Technologies Institute, LLC. (2020). RN Content Mastery Series 2019 National Standard Setting Study Report. Author: Leawood, KS.