

## Background and Objective

Early identification of barriers for academic success are crucial for optimizing student support strategies. Pre-admission math scores have been considered an important factor in predicting pharmacy student success.<sup>1</sup> Similarly, non-academic variables have been analyzed to help predict academic success during the admissions process.<sup>2</sup> By pairing a holistic interview approach with a specific scoring model, it may be easier to identify at-risk students and better predict academic success in the curriculum for first year pharmacy students. While this literature has studied overall pharmacy curriculum success, it is paramount to investigate specific variables and success within the first professional year.

**Primary Objective:** To investigate the relationship between pre-admission coursework performance and academic success for students in their first year of professional pharmacy curriculum.

## Methods

- Demographic and academic data was collected from PharmCAS applicants between 2013 and 2022.
- Data was matched against each respective class cohort via the registrar's office data.
- Performed a backward elimination multiple regression to identify key variables that impacted the risk of failure during first year.
- A composite scoring model was developed to assist in the evaluation of applicant academic risk during the admissions process and classified as either Tier 1 and Tier 2.

## Results

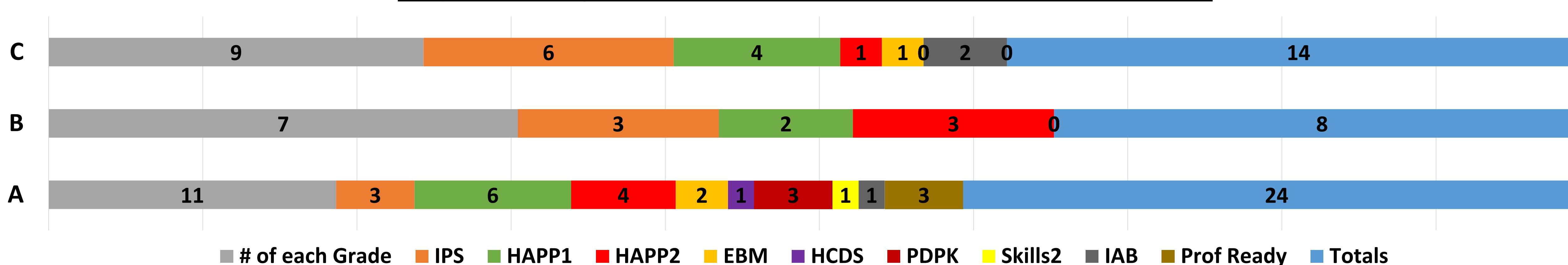
**Table 1: Curriculum 2.0 Tier 1 Course Failure Results**

Tier 1 Scores	≤4	5	6	7	8	9	10
No Course Failures	7	12	40	50	88	42	24
Failed at least 1 course	3	1	7	6	6	2	1
% that Failed at least 1 course	30.00%	7.69%	14.89%	10.71%	6.38%	4.55%	4.00%
Failed 2 or more courses	1	0	3	4	3	2	0

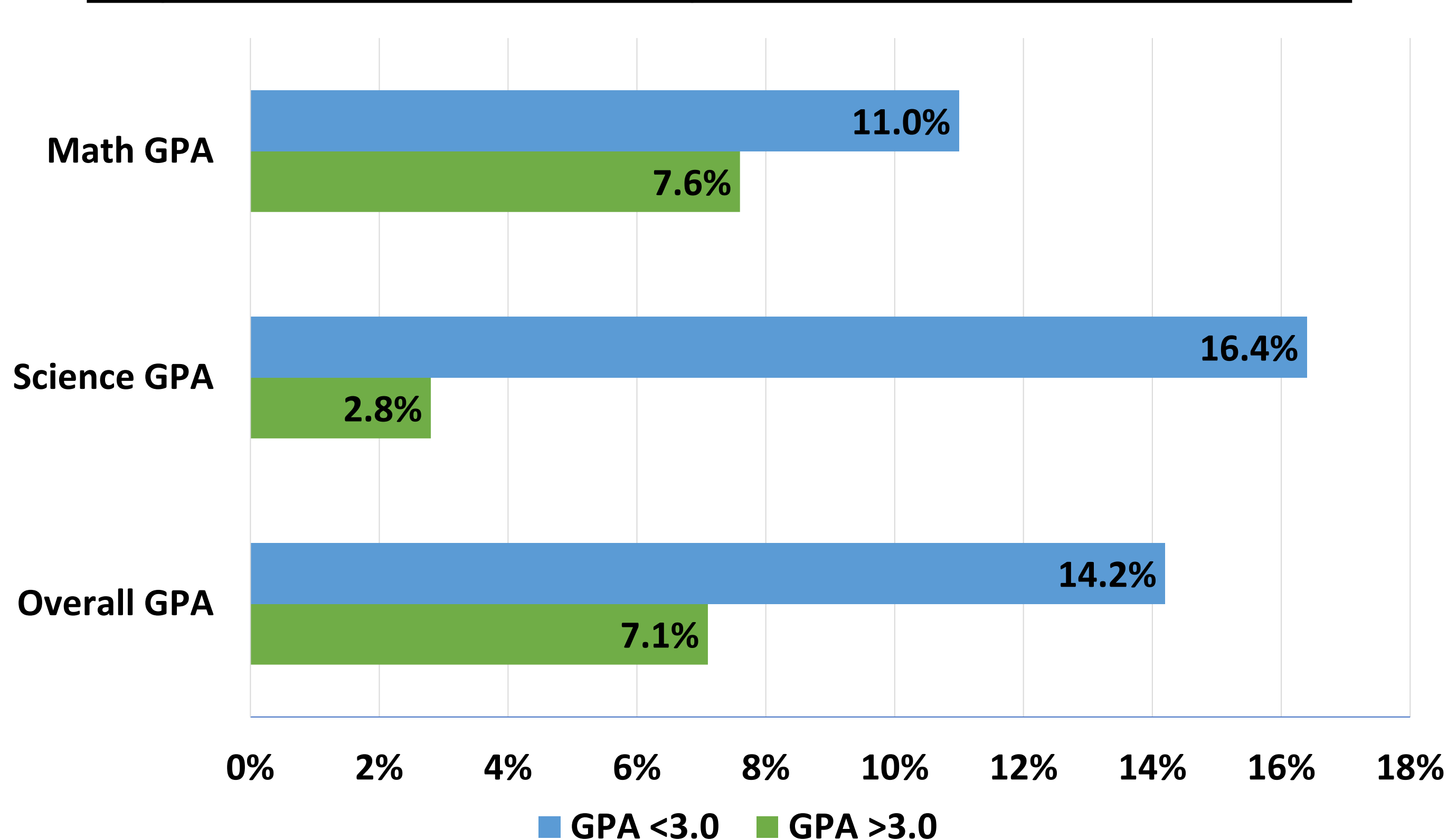
**Table 2: Curriculum 2.0 Tier 2 Course Failure Results**

Tier 2 Scores	≤10	11 - 12	13 - 14	15 - 17	18 - 20
No Course Failures	55	66	54	61	27
Failed at least 1 course	13	6	6	0	1
% that Failed at least 1 course	19.12%	8.33%	10.00%	0.00%	3.57%
Failed 2 or more courses	7	1	5	0	0

**Graph 1: Undergraduate Calculus Grades and P1 Class Course Failures**



**Graph 2: Admissions GPA Comparisons and Course Failure Rates**



**Table 3: Correlation Coefficients of Math Scores**

Undergraduate Course Grades & First Year Curriculum Course Scores	Pearson Coefficient Correlation*
Calculus & Pharmacy Calculations Score	0.30
Calculus/Pre-Calculus & Pharmacy Calculations Score	0.30
Other Math & Pharmacy Calculations Score	0.15
Statistics & Final EBM Exam Score	0.19
Statistics & Pharmacy Calculations Score	0.23
Statistics & IPS Score	0.24

\*A Pearson correlation coefficient was conducted for the 2022 cohort. All values are a positive low correlation and indicate either a **weak or very weak relationship** between undergraduate math grades and first year curriculum scores.

## Discussion

- This study investigated the impact of undergraduate courses and GPA as pre-admission variables for first year pharmacy school academic success.
- Students with the fewest first year course failures had an incoming overall and science GPA of >3.20.
- Students who repeated >8.0 credits of undergraduate math or science courses had a first year course failure rate of 16.3%.
- There was no significant correlation between performance in pre-requisite math courses and first year curriculum success.

## Conclusion

- Results from this study can be used to determine and inform admissions criteria.
- These variables can serve as early identifiers for students and can inform course directors to identify curriculum gaps to support student success.
- Further research is needed to determine if changes to pre-requisite criteria for undergraduate course requirements are necessary. These results may be applied to potential curricular changes within the first professional year of pharmacy school.

## References

1. Conn KM, Birnie C, McCaffrey D, Brown J. The relationship between prior experiences in mathematics and pharmacy school success. *American Journal of Pharmaceutical Education*. 2018;82(4):6257.
2. Mahan RJ, Mathys M, Minze MG, Sherrod SE, Seifert CF. An evaluation of nonacademic predictors of success in a doctor of pharmacy program. *American Journal of Pharmaceutical Education*. 2023;87(2):ajpe8924.