Can We Find Pharmaceutical Calculations Low Performers Before Class Starts?: Identifying Problem Solving Deficiencies

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BACKGROUND

- Recent increases in deficient pharmaceutical calculations grades have prompted internal reflection.
- Our experiences suggest some current students have difficulty applying problem solving skills to simple algebra-based word problems.
- Previous research suggests success in calculation courses is related to undergraduate GPA and PCAT scores, as well as time since and level of previous math exposure.
- Research is lacking as to what factors are related to pharmaceutical calculations performance.

OBJECTIVES

- To determine the relationship between an algebra-based word problem pretest and pharmaceutical calculations performance to identify those at risk of low performance.

RESULTS

Preadmission Demographics
- Out of 123 students completing both courses, 118 provided consent for this study.
- The mean age of participants was 19.69.
- Female was listed as gender for 62.7%.
- The mean high school GPA was 3.99.

Pretest Performance
- Figure 1 shows the distribution of pretest scores.
- The mean score was 15/18 (83.3%), ranging from 5 (27.8%) to 18 (100%).

Calculations Assessments
- Figure 2 shows the distribution of letter grades obtained from all calculations assessments, of which the mean was 115.7 / 150 (77.1%).

Correlations and Linear Regression
- Table 1 shows correlations between select study variables, and Table 2 shows a linear regression model for calculations sum scores.

Cutoff Scores
- Table 3 explores parameters of various pretest cutoff to predict passing pharmaceutical calculations assessments (i.e., >70%).

IMPLICATIONS

- After controlling for age, gender, earlier academic performance, and standardized test scores, an algebra-based word problem pretest was associated with performance on later pharmaceutical calculations assessments.
- Although the pretest is associated with calculations performance, there is no perfect cutoff using the pretest alone (i.e., sacrificing sensitivity for specificity or vice versa depending on criteria).
- The next step in this line of inquiry is to determine how to reduce this deficit through deliberate supplementary content and structured problem solving activities for those in need.

REFERENCES