Introduction

To assess the predictive validity of the MMI, in comparison to the pre-pharmacy average and PCAT score, with respect to academic performance of the 2010 admission cohort in the B.Sc. Pharm. curriculum over the four years.

Methods

• Performance with IBPRI Statistics 2.22 with α=0.05
• Predictor and criterion variables were checked for assumptions of multiple regression: normality, linearity, homoscedasticity and absence of multicollinearity
• Reliability of the 2010 MMI assessed using 2-way random effects ANOVA to calculate an intraclass correlation coefficient (ICC)
• Discriminant validity of the 2010 MMI relative to PCAT and pre-pharmacy average assessed using Pearson correlation coefficients
• Predictive validity of the MMI assessed using two multiple regression models:
  - Full Model: Predictor variables: pre-pharmacy average, PCAT composite (scaled score), gender, age, MMI T-score
  - Criterion Variables: course grades, aGPA
  - Reduced Model: Full model less the MMI T-score
  - Calculated difference in AdjR2 between full and reduced model to determine percent variance attributable to the MMI

Results

Table 1: Correlations Between Admission Tool Scores for All Interviewees (n=238)

<table>
<thead>
<tr>
<th>Predictor Variables</th>
<th>Year 1 aGPA</th>
<th>Year 2 aGPA</th>
<th>Year 3 aGPA</th>
<th>Year 4 aGPA</th>
</tr>
</thead>
<tbody>
<tr>
<td>MMI score</td>
<td>0.419</td>
<td>0.419</td>
<td>0.342</td>
<td>0.321</td>
</tr>
<tr>
<td>PCAT score</td>
<td>0.124</td>
<td>0.106</td>
<td>0.116</td>
<td>0.120</td>
</tr>
</tbody>
</table>

Table 2: Characteristics of 2010 Admission Cohort (n=238)

<table>
<thead>
<tr>
<th>Admission Tool Scores</th>
<th>Mean (SD)</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Pharmacy Average</td>
<td>82.9 (2.4)</td>
<td>82.9</td>
</tr>
<tr>
<td>PCAT Composite (Percentile)</td>
<td>65.2 (11.1)</td>
<td>65.2</td>
</tr>
<tr>
<td>Gender</td>
<td>Female</td>
<td>139 (58.4)</td>
</tr>
</tbody>
</table>

Figure 1: Number of Course Grades Significantly Predicted by Each Admission Tool (%)

Total courses: Year 1 = 7; Year 2 = 10; Year 3 = 10; Year 4 = 6

Discussion

- The ICC for MMI scores was 0.73, exceeding the acceptable reliability threshold of 0.70. 7
- Low correlations between the MMI and the other admission tools (i.e. pre-pharmacy average and the PCAT), versus moderate correlation between PCAT and pre-pharmacy average, indicates the MMI assesses different attributes than the other admission tools (Table 1)
- Table 2 summarizes relevant descriptive statistics of the admitted cohort of 2010
- As depicted in Figure 1, pre-pharmacy average significantly predicted every grade in all years of the curriculum, the MMI and PCAT each predicted about 25% of individual course grades
- The incremental AdjR² contributed by the MMI to aGPA increased over the 4 years from -0.1% to 1.0%, while the PCAT contribution decreased from 1.3% to -0.3% (Table 3)
- Pre-pharmacy average was consistently the strongest predictor of grade variance across all four years, with a mean incremental AdjR² of 9.8% (Table 3)

Limitations

- Regression analyses were not performed on courses with a non-numerical course grade (e.g. Honours/Pass/Fail) or low enrollment
- Consequently, 7 out of 40 total courses were not analysed; including the year 4 experimental rotations (Structural Experimental Program courses), which would be expected to correlate with MMI scores
- Pharmacy GPA and course grades are only surrogate measures of clinical performance as a pharmacist
- A separate analysis was conducted with courses from the Pharmacy Examining Board of Canada licensing exam as criterion variables. These scores should be more reflective of clinical performance.

References

1. Cameron AJ, MacKeigan LD. Development and pilot testing of a multiple mini-interview for admission to a pharmacy degree program at the Leslie Dan Faculty of Pharmacy (2010). UNIQ, Article 10.

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