

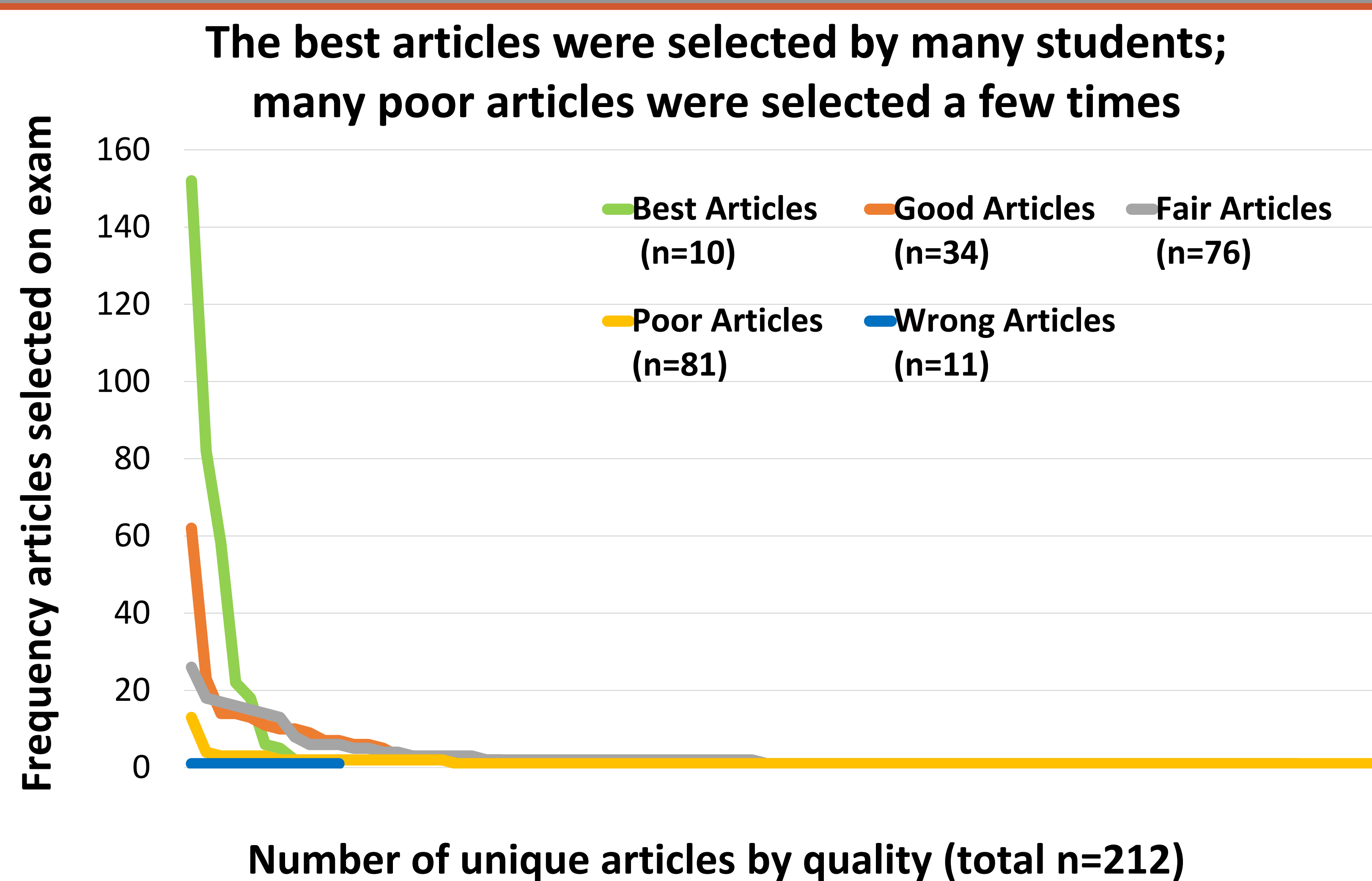


# Searching for Evidence: An Analysis of Medical Student Examination Data

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## Context

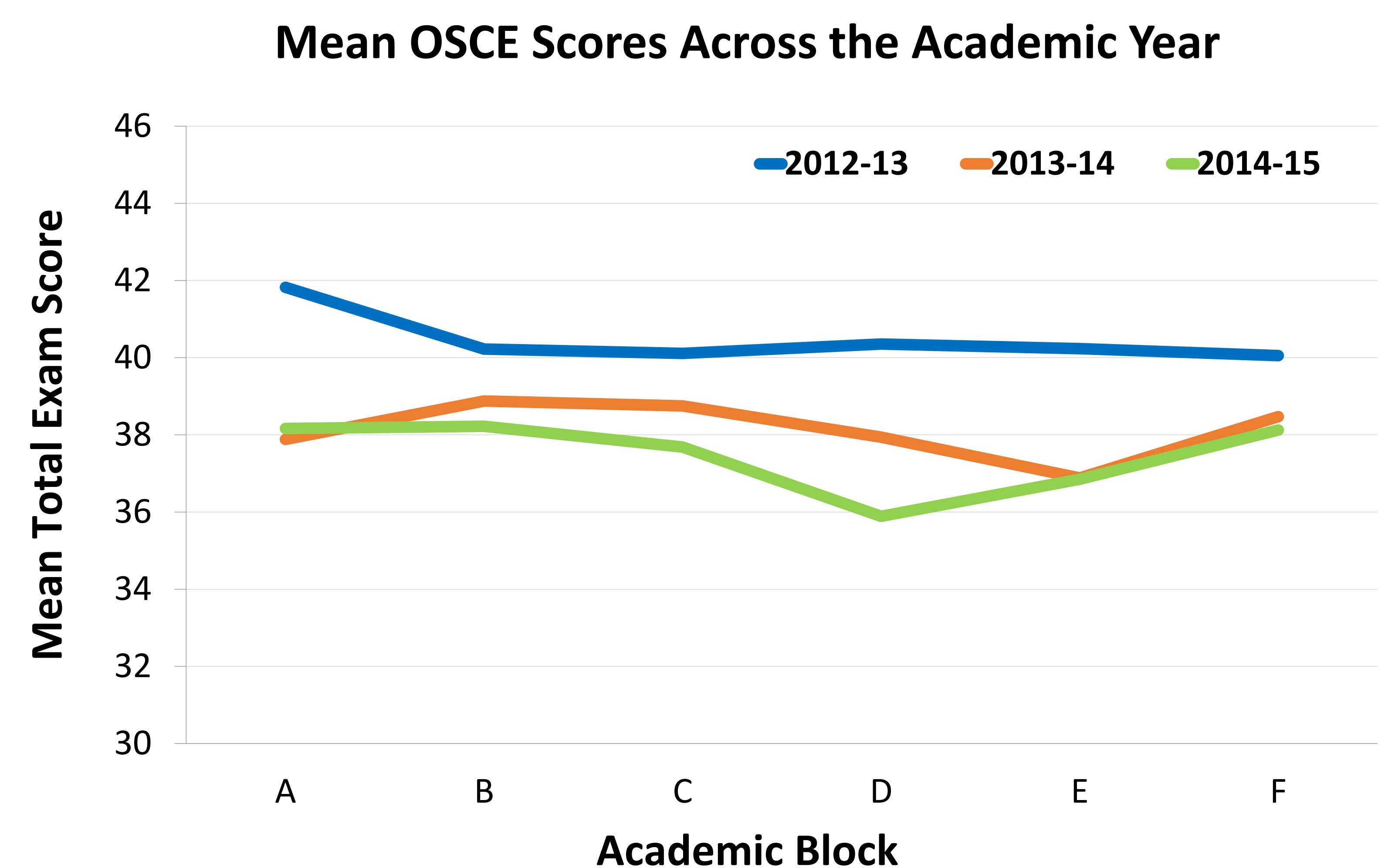
- Second year medical students complete an EBM Objective Structured Clinical Examination (OSCE) during their Internal Medicine rotation.
- Librarians grade student responses and discuss 1-on-1.
- The exam includes four sections based on a clinical case that asks whether advanced care planning can improve patient experience with end-of-life care:
  - Finding the literature: developing a PICOTT (Patient, Intervention, Comparison, Outcome, Type of Question, Type of Study) and conducting a search
  - Selecting appropriate articles
  - Appraising the validity of a given article
  - Analyzing the article results



## Methods

Retrospective analysis of anonymized student examination data from 2012-2015 EBM OSCE station. Using Spearman rank order correlation analysis and descriptive statistics, we analyzed the following relationships:

- Which aspects of the student's ability to correctly define the PICOTT and conduct a PubMed search predict selection of high quality, relevant articles?
- Are the skills necessary for appraising the literature related to the skills necessary for finding appropriate literature?
- Do student scores change over time based on which block (2 month Internal Medicine rotation) they are in during the academic year?



## Findings

### Descriptive Analysis:

- 16% incorrectly identified the type of question (i.e., therapy vs prevention)
- 15% misused Boolean operators
- 46% selected articles that did not match the patient population
- Some students struggled with validity appraisal:
  - Intention to Treat analysis (14%)
  - Follow-up (12%)
  - Equal Treatment (11%)
- Most students did not struggle with analyzing results
- Changes in test administration might impact student performance; changes made locally included:
  - 2013-2014: Graded → pass/fail
  - 2014-2015: Instruction shifted from beginning of rotation to 3 days before exam

### Correlation Analysis:

- PICOTT formation scores are weakly correlated with quality searching and article selection.
- Article selection scores and overall search quality are weak-moderately correlated.
- Among search tasks...
  - Narrowing to the right study design is most highly correlated with article selection quality; however, only 73% of students correctly used a study design limit
  - Using Boolean operators and searching on outcomes were not correlated with
    - article selection quality
- Scores from finding the literature were weakly correlated with scores for appraising the literature.

### Correlations

Item	Item	Correlation
Limiting to study design	Article selection score	.44 p < .0001
Search score	Article selection score	.34 p < .0001
PICOTT score	Article selection score	.25 p < .0001
Search score	Appraisal score	.24 p < .0001
Finding the literature	Appraising the literature	.24 p < .0001
PICOTT score	Search score	.21 p < .0002
Boolean	Article selection score	.08 p = .1573
Searching on outcome	Article selection score	.06 p = .2821

## Teaching Takeaways

- Emphasize the importance of study design when answering clinical questions.
- Don't worry so much about Boolean; PubMed can take care of that for simple searches.
- Discuss how to choose relevant articles.
- Check your assumptions! Librarians perceived that students struggle with differentiating blinding and concealed allocation, but 91% of students got both correct.
- Some of our findings may be specific to the clinical question used in the exam and are not generalizable.

