

Section Header	Description
Institution Name	Rosalind Franklin University of Medicine and Science
Institution Characteristics	Private medical and health sciences university; 2015 FTE enrollment, 8 FTE library staff (3 Librarians; 1 administrative director; 2 Library Assistant IIs; 2 Library Assistants)
CARLI Counts Participant Name + Job Title	KatieRose McEneely, Electronic Resources Librarian
Project Name/Title	Librarian-Led Critical Appraisal Workshop for Second-Year Medical and Podiatry Students: Outcomes and Reproducibility
Single Sentence Abstract	The Boxer Library partnered with a medical school faculty member to offer a gamified approach to building critical reasoning skills for medical and podiatry students.
Motivation(s) for Project	<p>This project was important because the library is not well-integrated into the curriculum at the university. Most library instruction is not a requirement for faculty and is thus considered optional by the students. Attendance is low as a result; one lecture for a class of 300 students had 3 attendees; other students left the session once it was identified as Librarian-led.</p> <p>A required workshop embedded in the curriculum for two of the schools at the university would increase library visibility and give increased weight and legitimacy to librarian-led instruction.</p>
Partners and Stakeholders	<p>Stakeholders include the following:</p> <ul style="list-style-type: none"> ● Faculty. Faculty in charge of the ECR course invited Librarians to lead the workshop and made attendance required for all students. ● Students. Students were required to attend the workshop, which taught skills that would be required for passing their Board examinations. ● Librarians. Librarians created and led the workshop. Successful workshop outcomes would indicate that a librarian presence in the course would

	<p>increase student engagement and success, which would further indicate a benefit from incorporating Librarians and library resources into the required curriculum.</p>
Inquiry Question	<p>What is the impact of library-provided instruction on student engagement when learning about critical appraisal in health sciences literature? Does creating an interactive workshop increase student engagement more than a traditional lecture?</p>
Study Participants/Population	<p>An 80-minute workshop presented to approximately 300 second-year medical students and second-year podiatry students enrolled in the Elements of Critical Reasoning course. Four workshop sessions were presented over two days.</p>
Method(s) of Data Collection and Analysis	<p>The 80-minute workshop consisted of a brief lecture; a true/false "Mythbusters" exercise; small group critical appraisal activities designed by librarians and led by fourth-year medical students equipped with answer keys; and a timed calculation. Half-sheet physical surveys consisting of four-point Likert scales and short-answer questions were distributed to each group prior to the end of the workshop. 106 attendees returned surveys, an approximate response rate of 35%. Survey results were entered into a LibWizard survey after collection; handwritten comments were typed and included in the survey digitization.</p>
Findings	<p>Survey results were mixed. Podiatry students reported having encountered this material in previous coursework, while medical students reported that it was new to them. Results also indicated that students preferred the small-group discussion and true/false activities over a traditional lecture on the same material.</p> <p>Librarians refined instruction as each workshop progressed, namely spending less time on true/false activities and allocating more time to the small group activity, where students were given an unfamiliar article and asked to determine whether or not it was a</p>

	<p>quality piece of research. There was a notable but anecdotal improvement in student engagement as the workshops progressed, though this may have been due to librarian facilitators becoming more experienced with managing the group.</p>
<p>Use of Findings</p>	<p>The findings have informed the next year's cohort of students and has been used to make a case for introducing these concepts earlier during medical education. Additionally, the workshops were streamlined for online instruction and were taught to a similar population in September 2020. Preliminary survey results indicated that the workshop was useful in introducing students to the elements of critical reasoning when reviewing evidence-based medicine.</p>
<p>Next Steps and Other Results</p>	<p>Librarians are writing a detailed paper of the workshops and their survey responses. The abstract has been accepted for presentation at the Medical Library Association's 2021 Annual Conference. Librarians are also in the process of working with faculty to make this a required element of the course, so as to ensure sustained participation.</p>
<p>Additional Reflections</p>	<p>Additional context for the workshop includes data regarding how evidence-based medicine and critical reasoning skills are a necessary element of health sciences education and practice. Notably, it is also a skill that is evaluated in the USMLE, a medical licensing exam. Librarians have thoroughly documented the activities that make up the workshop, including gamification of a checklist; the workshop has already proven to be reproducible at RFUMS.</p> <p>Challenges include having only two librarians available to facilitate such large workshops; and the amount of time it takes to prepare the small group activities, since these activities involve comparing two randomized controlled trials, and Librarians make an effort to provide both peer-reviewed and preprint materials that are relevant to the students' other coursework.</p>

	<p>The assistance of fourth-year medical students and volunteer faculty members for the small group activities were helpful, but presented challenges of their own, since librarians had only fifteen minutes in which to train volunteers to facilitate the exercises. Providing answer keys was helpful in mitigating frustration.</p> <p>This was a low-budget study and did not require numerous resources, aside from staff time, access to library collections, and printing costs. Library staff selected example articles and highlighted the critical sections for evaluation exercises and created packets for each small group. A library assistant created a card-matching exercise, which was printed in-house.</p> <p>In the September 2020 online version of this workshop, the physical card exercise was replaced with a Google Sheet checklist; small group facilitators were given an answer key. There was a wide range of comfort with the technology used in the Zoom sessions, with some faculty providing a less rigorous small group experience than others who were more comfortable using the resources at hand.</p>
Timeline	<p>Librarians were given approximately two weeks to prepare the workshop. After meeting with faculty and discussing the amount of time planned, as well as requesting the help of fourth-year medical students to facilitate small group activities, the Instruction and Reference Librarian searched for and evaluated randomized controlled trials; created 14 packets of materials, one for each small group; and enlisted the help of a library assistant to draft and print cards for the activity. The university's marketing department offered to print and laminate red and green cards and a checklist for each group. Librarians ran a mock version of the workshop in order to assess the timing needed for each section.</p> <p>On the first day of the workshop, the librarians ran through the workshop outline</p>

	<p>and the activity with the small group facilitators, the first two workshops, each lasting about 80 minutes, ran back-to-back with a ten-minute break between them. During the break, the survey instrument was revised so that it was shorter and asked fewer questions; some elements of the Powerpoint presentation were condensed during this time.</p> <p>The third and fourth workshops took place later the same week. Afterwards, paper surveys were entered into LibWizard by library assistants so Librarians could evaluate the results (this turned out to be a wise move, as the following week the library moved to remote work due to the COVID-19 pandemic). Survey results were compiled by the Electronic Resources Librarian and presented to the faculty member in charge of the course. Librarians were invited to present a digital version of the workshop to a new cohort of students the following academic quarter.</p>
Bibliography/Works Cited	n/a
Appendices	<p>Survey Instrument One Survey Instrument Two Card Game Outline Workshop Outline</p>

Appendices

Survey Instrument: Session One

Critical Appraisal Workshop

Introduction and trivia activity were effective in teaching me about

Scientific literature in Evidence-Based Medicine

Strongly Agree	Agree	Disagree	Strongly Disagree
1	2	3	4

Randomized Controlled Trials

Strongly Agree	Agree	Disagree	Strongly Disagree
1	2	3	4

The case discussions were effective in teaching me about

Event Rates and Risk Reduction

Strongly Agree	Agree	Disagree	Strongly Disagree
1	2	3	4

Rate and Risk calculations

Strongly Agree	Agree	Disagree	Strongly Disagree
1	2	3	4

Overall, given the choice, I would attend this workshop over attending a traditional lecture on the same topics

Strongly Agree	Agree	Disagree	Strongly Disagree
1	2	3	4

Do you have any additional comments for the presenter?

Have you seen this material before? If so, in which class?

Survey Instrument: Sessions Two-Four

Critical Appraisal Workshop

Introduction and trivia activity were effective in teaching me about

Scientific literature in Evidence-Based Medicine

Strongly Agree	Agree	Disagree	Strongly Disagree
1	2	3	4

Randomized Controlled Trials

Strongly Agree	Agree	Disagree	Strongly Disagree
1	2	3	4

Overall, given the choice, I would attend this workshop over attending a traditional lecture on the same topics

Strongly Agree	Agree	Disagree	Strongly Disagree
1	2	3	4

What would you do to improve this workshop?

(Examples: *Spend more time on randomized controlled trials; discuss articles after completing activity; elaborate on [topic]***)**

Have you seen this material before? If so, in which class?

Card Game Outline

Critical Appraisal Trivia Game

(Each question is on a card: Green Card for a correct answer, Red card for incorrect, 15 of each)

14 sets of cards.

What would you calculate to find how often an event due to an intervention like a drug or therapy happened in the control group?

- Experimental Event Rate (EER)
- Control Event Rate (CER)
- Absolute Risk Reduction (ARR)
- Patients' Expected Event Rate (PEER)

What would you calculate to gauge the rate in which the experimental treatment increases the risk of a good event?

- Experimental Event Rate (EER)
- Control Event Rate (CER)
- Absolute Risk Reduction (ARR)
- Relative Benefit Increase (RBI)

What would you calculate to find the difference in risk rate between an experimental and control group?

- Experimental Event Rate (EER)
- Relative Risk Reduction
- Control Event Rate (CER)
- Absolute Risk Reduction (ARR)

What would you calculate to gauge the amount of patients needed within a trial to prevent a negative outcome due to the proposed therapy?

- Number Needed to Harm (NNH)
- Number Needed to Treat (NNT)
- Absolute Risk Reduction (ARR)
- Confidence Interval (CI)

When is something considered statistically significant according to the P values?

- P value $< .05$
- P value = .06
- P value $> .5$
- P value > 1.0

What do we need to consider if applying the study to our patient?

- The benefits and harms from the treatment
- If the patient has similar characteristics to participants in the study
- The patients' values and preferences
- All of the above

What section of the article can you use to help you review the researchers' process for conducting the study?

- Introduction
- Methods
- Results
- Discussion

What type of study would you need if you wanted a summary of the literature in a particular area?

- Systematic Review
- Observational Study
- Clinical Practice Guideline
- Case Report

What type of material would you use if you wanted to find published statements to help clinicians make healthcare decisions?

- Systematic Review
- Observational Study
- Clinical Practice Guideline
- Case Report

The smaller the sample size, the more applicable it is to a large population.

- True
- False

What is the importance of being able to identify researchers conflict of interest?

- To identify a possibility of potential bias.
- It is not important.
- To see where the researchers are affiliated

Should you base a clinical decision on one randomized controlled trial?

- Yes
- No

What is the date range that you should strive for when searching for health sciences studies?

- 5-10 years
- 10-15 years

- 15-20 years
- 20-25 years?

What is the main thing researchers are trying to avoid when randomizing a study?

- Bias
- Negative Outcomes
- False Positives
- Study Participants Preferences

What is a double blind study?

- Both participants and researchers are unaware of treatment.
- Only participants are aware of treatment.
- Only Researchers are aware of treatment.
- Both participants and researchers are aware of treatment.

Using your article what is the absolute risk reduction?

Using your article what is the confidence interval?

Using your article, what is the number needed to treat?

Workshop Outline

Outline for CMS Workshop -80 minutes total

Purpose: The purpose of this workshop is to provide students with tools they can easily use when reviewing studies. Also give an introduction on what a study looks like, etc.

Goal is to talk no more than ten minutes without any interaction.

Each section has a few audience response questions, then content, and then questions or activity.

Technology used: Powerpoint, True/False pages, card game

Introduction: 10 minutes

Mythbusters: Critical Appraisal Edition. - 7 minutes (Kahoot)

- If a study is published in a journal it is a high quality study.
- All open access journals are high quality.
- All studies are applicable to any patient.
- Every journal has the same peer review process.
- Anything you find on Google Scholar is reliable.
- No research is reliable.

Today's Agenda - 2 minutes

- What are the different types of journal articles?
- How to evaluate the quality of those articles.
- How to apply it to a case.

Section 1- Why is research important in EBM? 10 minutes

Questions:

Part 2: What are the different types of Journal Articles? 10 minutes

- Types of Journal Articles:
- Research Study or Review Articles
 - Types of Research Articles
 - Randomized Controlled Trial
 - Observational studies
 - Types of Review Articles
 - Systematic Review
 - Narrative Review

Three questions about what was just talked about

Section 2: Are the results of the Individual Study valid?

What are the bones of an RCT?

Sections of RCT

How to use the methods section to evaluate an RCT.

Part 1 question

10-15 minutes

Slides:

Was the assignment of the patient randomized?

Was the randomization concealed?

Were the groups similar at the start of the trial?

Was the followup of patients sufficiently long and complete?

Were all patients analyzed in groups to which they were randomized?

Were patients, clinicians, and study personnel kept blind to treatment?

Were groups treated equally, apart from the experimental therapy?

Are the valid results applicable to a patient?

Part 3: worksheet (10 Min)

Part 4: Review (5 minutes)

Section 3: Are the valid results of this individual study important?

- What is the magnitude of the treatment effect?
- How precise is this estimate of the treatment effect?
- Is our patient so different from those in the study that its results cannot apply?
- Is the treatment feasible in our setting?
- What are our patients potential benefits and harms from the therapy?

Part 2: Worksheet

Wrap Up/Survey Distribution