

Teaching Evidence-Based Medicine Through Facilitated Journal Clubs

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Introduction

Retrieving evidence-based clinical information is an essential skill for medical professionals. The Liaison Committee on Medical Education emphasized the importance of evidence-based medicine (EBM) in medical curricula when “retrieving and applying evidence” became a Core Entrustable Professional Activity.¹ In preclinical medical education, teaching EBM in an integrated and relevant manner remains challenging. The use of a multifaceted approach that includes journal clubs, workshops, or online sessions may be helpful in increasing skills and confidence when teaching EBM.²⁻⁴

To enhance our EBM teaching, we created a journal club-based curriculum for a cohort of students. We evaluated effectiveness by measuring changes in students’ knowledge and confidence related to evidence analysis.

Methods

Setting

We implemented our EBM Journal Club curriculum (EBMJCC) at Oregon Health & Science University (OHSU), a tertiary center in Portland, Oregon. Students participating in this curricular intervention were part of an 18-month longitudinal preclinical preceptorship.⁵ Students self-selected into this program, which focused on patient navigation for psychosocially complex primary care patient populations. The EBMJCC transitioned to modified operations and virtual learning during the COVID-19 pandemic. In OHSU’s general EBM curriculum, all preclinical students complete four 90-minute small group sessions over 18 months focusing on EBM principles.

Curriculum and Participants

Eight students participated in the EBMJCC between May 2020 and August 2020, over eight sessions. Sessions were 1 hour long, with the first 20 minutes dedicated to student presentation of a paper focused on specific patient experiences. Students were provided a seven-page Evidence Cycle Summary⁶ and were encouraged to form clinical questions that would support their work with patients.

Student graduates of the program facilitated discussion of a preselected article for the remaining time. Selection of articles occurred a few weeks in advance of each session to maximize flexibility in identifying timely, pertinent literature. EBM principles outlined by Duke directed selection of education topics,⁶ illustrating themes that were salient to EBM or relevant to structural determinants of health (Table 1). A faculty member

was also available during the session.

Evaluation

We assessed students' EBM knowledge and confidence in EBM principles using the Modified Fresno Test (MFT)⁷ and the Evidenced-Based Practice confidence (EPIC) scale.⁸ We assessed scores before and after the eight sessions. Survey responses were collected via Qualtrics software (Provo, UT). The MFT assessed knowledge and was scored independently using a standard rubric by two student graduates. Scoring discrepancies were discussed and, if needed, brought to the faculty supervisor for a tie-breaking score. We calculated total scores based on the sum of the seven domains. We averaged and compared pre- and postintervention scores. We assessed confidence using a 10-point Likert scale over the 11 domains of the EPIC scale. We calculated mean scores for each domain for both the pre- and postcurriculum test. Wilcoxon Signed Rank Tests were used to assess statistical significance ($P < .05$) using SPSS Software (Chicago, IL). OHSU's Institutional Review Board deemed this educational activity exempt from oversight.

Results

Students' knowledge and confidence improved following completion of the EBMJCC. Average improvement on the MFT was 18%. Specifically, six of the eight students improved their scores on the MFT, ranging from 2.5% to 75% improvement in overall score ($P = .21$). Two of the students' scores decreased by a mean of 11.5 points out of 168 total possible points (-6.8%). Of the EPIC scale's eleven categories, students showed statistically significant improvements in nine categories ($P < .05$; Table 2). Two areas of improvement were in formulating research questions and applying knowledge to specific patients.

Conclusions

Our eight-session EBMJCC improved preclinical medical students' knowledge and confidence in applying EBM principles to primary care patient populations. Students' confidence improved in all categories, and we noted an almost 20% increase in EBM knowledge. Our data support the use of familiar, simple interventions to achieve these gains in a virtual setting. Additionally, our intervention uniquely engages students in learning EBM principles via discussion of recently published literature.

The limitations of our study are its small sample size, the selection bias of our self-selected sample, and the use of pre/postintervention statistics instead of more delayed evaluation. Although a small cohort, the results were promising, and this style of learning was subsequently implemented broadly in the preclinical curriculum.

Our pilot experience demonstrates that a student-facilitated journal club series can be used to effectively teach EBM principles, with meaningful increases in student knowledge and confidence. These skills are critical to their future as medical providers and will provide a foundation for more equitable and evidence-based care.

Tables and Figures

Table 1: Outline of Activities

Theme	Article Title	Educational Takeaway
Randomized controlled trials in a real-world setting	Incorporating Patients' Social Determinants of Health into Hypertension and Depression Care: A Pilot Randomized Controlled Trial ⁹	Introduction to journal club
How to start a new project in clinic	Implementing Clinic-Wide Depression Screening for Pediatric Diabetes: An Initiative to Improve Health Care Processes ¹⁰	PICO
Utility of the electronic health record	Rapid Response to COVID-19: Health Informatics Support for Outbreak Management in an Academic Health System ¹¹	Internal/external validity
Modeling	How Resilient Is the United States' Food System to Pandemics? ¹²	Search strategy and appropriate sources
COVID-19 comorbidities	Cardiovascular Disease, Drug Therapy, and Mortality in COVID-19 (now retracted) ¹³	Generalizability
Mental health	The Psychological Impact of Quarantine and How to Reduce It: Rapid Review of the Evidence ¹⁴	Systematic reviews
COVID-19 treatment	Compassionate Use of Remdesivir for Patients with Severe COVID-19 ¹⁵	Bias
COVID-19 disparities	Variation in COVID-19 Hospitalizations and Deaths in New York City Boroughs ¹⁶	Ratio calculation

Table 2: Mean Score Differences Among 11 EPIC Categories

EPIC Question	Pre Score (Mean)	Post Score (Mean)	Mean Score Difference	P Value
Identify gap	60	85	+25	.02
Formulate question	62.5	86.25	+23.75	.02
Conduct search	67.5	85	+17.5	.07
Study properties	53.75	78.75	+25	.02
Study measures	46.25	75	+28.75	.02
t test/c2	53.75	68.75	+15	.09
Regression	45	70	+25	.03
Application to patient	68.75	87.5	+18.75	.03
Patient needs/values	73.75	90	+16.25	.04
Integrate evidence	52.5	83.75	+31.25	.02
Evaluate effect	53.75	80	+26.25	.02

Abbreviation: EPIC, evidenced-based practice confidence.

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