# A Curriculum to Promote Smarter Use of Observational Data

**Jenny Gong, BS[1],Kristina Garrels, MD[2],Johnbuck Creamer, MD[2]**

[1]Case Western Reserve University School of Medicine, Cleveland, OH; [2]Metrohealth Medical Center, Cleveland, OH

## BACKGROUND

Research using EHR data requires different statistical approach then a randomized control trial. A curriculum to enhance the understanding of retrospective observational data may prepare healthcare professional students for EHR-based research opportunities[1]. Spaced repetition has been shown to be an effective learning format without time and space constraints of traditional didactic instruction. Qstream has been shown to be an effective delivery model for multiple healthcare curriculums for ranging from medical students to fellows[2-4].

## OBJECTIVES

We created a spaced repetition curriculum to increase medical students' knowledge of four topics especially relevant to EHR data: causality, bias, data representativeness, data integrity

Our objectives are two-fold for our participants:

1. Increase in knowledge of observational data projects assessed by curriculum progress and pre and post-curriculum surveys
2. Increase in confidence in conducting their own observational population health data projects

## METHODS

The curriculum was delivered via Qstream to 18 healthcare professional students at Case Western Reserve University.

- 20 multiple choice questions were delivered over a period of 3 months
- Pre and post-survey assessing confidence and knowledge of observational data

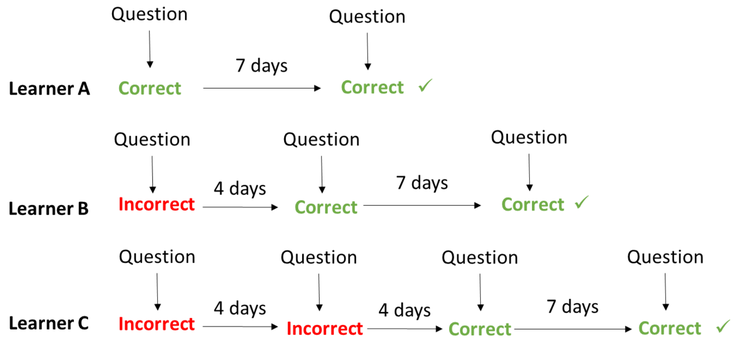


Figure 1: **Methodology of the spaced repetition curriculum.** Participants complete a question by answering correctly twice consecutively. Completed questions are resent either 4 days or 1 week, incorrectly or correctly, respectively. Questions expired if not answered on time.

## RESULTS

- 5 (27.8%) students completed the curriculum
- Average improvement in accuracy of 18% across four categories
- Preliminary increase in self-reported confidence levels in conducting their own studies
- 66.7% of students began with low confidence in their observational data skills

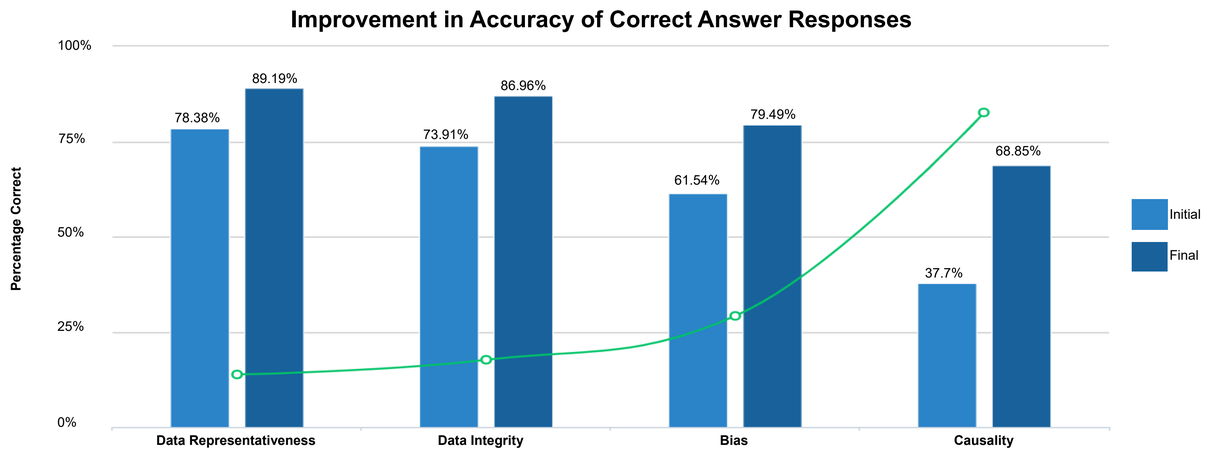


Figure 2: There was an improvement of 10.81% in data representativeness, 13.05% in data integrity, 17.95% in bias, and 31.15% in causality.

## CONCLUSIONS

- In the limited group that completed the curriculum, there is improvement across all four categories
- There is a preliminary increase in self-reported confidence levels in conducting their own studies
- There appears to be a need for an observational data curriculum among healthcare professional students
- To accurately assess if spaced repetition is an effective method, obstacles that prevented completion in this study would need to be explored and addressed

## LESSONS LEARNED

1. It is necessary to engage with students to create a program that meets their goals and expectations to maintain their interest
2. Crafting quality multiple-choice questions takes a significant amount of time

## REFERENCES

1. Greenhalgh T, Howick J, Maskrey N, Evidence Based Medicine Renaissance G. Evidence based medicine: a movement in crisis? BMJ (Clinical research ed) 2014;348:g3725-g.
2. Robinson T, Janssen A, Kirk J, et al. New Approaches to Continuing Medical Education: a QStream (spaced education) Program for Research Translation in Ovarian Cancer. Journal of Cancer Education 2017;32:476-82.
3. Janssen A, Shaw T, Bradbury L, et al. A mixed methods approach to developing and evaluating oncology trainee education around minimization of adverse events and improved patient quality and safety. BMC Medical Education 2016;16:91.
4. Barsoumian AE, Yun HC. Augmenting Fellow Education Through Spaced Multiple-Choice Questions. Military Medicine 2017;183:e122-e6.