Evaluation of a Summer Healthcare Improvement Program (SHIP) in Undergraduate Medicine Education

P. Barber, J. Halasz, L. Truong, K. Raffael, C. Phan, P. Mathura, Dr. J. Croden, Dr. T. Hillier and Dr. N. Kassam

Edmonton Zone Medicine Quality Council
Partnerships in Action
Strategic Clinical Improvement Committee

INTRODUCTION

Background, Problem Statement and Goal Statement: Quality Improvement (QI) science is quickly becoming an effective and acceptable approach for teaching physicians how to inspire and lead positive change in healthcare. QI supports patient safety, improves system efficiency and medical students are recognizing QI as an integral principle for their future careers as physicians (Teigland et. al, 2013).

Problem Statement: Currently, across Canada there is minimal experiential education for undergraduate medical students regarding quality improvement. Students learn little about how they can change the systems that they will work in and are missing out on exposure to the leadership potential of their roles. In a response to this opportunity, the UA DoM, AHS and UA UME developed the Summer Healthcare Improvement Program.

Goal Statement: To achieve this, the Summer Healthcare Improvement Program (SHIP) was created, and aims to:

1) Provide basic QI literacy, real time QI application/experience within a clinical setting and mentorship by a QI specialist and Physician QI lead
2) Explore how we may teach undergraduate students QI principles effectively and whether undergraduate students are interested in learning QI
3) Empower a group of passionate students with QI tools and experience early in their career
4) Evaluate the effectiveness of any changes made through this program and how it may be improved

This project aims to evaluate the effectiveness of the SHIP program over 3 years (2017-2019), to determine whether educating undergraduate medical students on QI is beneficial and achievable over the summer (May-Aug) months.

PROBLEM

Environmental Scan and SWOT

At the University of Alberta, prior to the launch of this program, the main form of undergraduate QI education involved a 2h lecture on "Just Culture" and patient safety. While QI education in undergraduate medical education is more common in the states (Henry, 2016), currently, only two other Canadian schools were found to have in depth QI programming for undergraduate medical students. Program of Improvement in Medical Education (PRIME) at McMaster University (Brown et al., 2018) is a 12-week program for first-year medical students. Students first participate in a workshop that provides the foundational knowledge of QI. Small groups of students then find a 'quality gap' in their own medical education and propose an intervention that will address this gap, use standard QI project tools and write implementation plans/PDSA cycles. The University of Calgary's Cumming School of Medicine offers a course called Applied Evidence Based Medicine in Quality Improvement where students are taught the basics of QI in healthcare and then come with their own projects that are presented at the end of the course (W21C, n.d.).

However, many schools offer QI training to residents. Recently, UofA provided Evidence-based Practice in Quality (EPIQ) training to 110 residents, with 94% of residents preferring this method of learning to previous years and 40% being interested in running QI projects (Collins et al., 2018).

SWOT

Strengths
- Dedicated QI Consultant to support physician QI leads
- Direct access to AHS QI Framework and frontline teams/projects
- Grant funding obtained
- Supportive UME Faculty
- Passionate students looking for opportunities
- EHIN Student Group

Weaknesses
- One QI Consultant to support QI education, projects, physicians, residents and medical students
- Physicians are building QI capacity; limited mentors
- Limited funding
- AHS QI Consultants minimally support physician-led projects

Opportunities
- Collaboration between UofA DoM, UME and AHS
- QI added to CanMEDS and recognized scholarly
- UofA UME Support for further QI education in undergrad
- UA-AHS QI Collaboration Day event to showcase QI projects and learners involved

Threats
- Traditional Summer research opportunities
- Higher paying summer jobs
- Each QI project varies greatly therefore tasks required vary
- Continuity between years as students change roles

METHODS (PROGRAM DESCRIPTION)

Summer Healthcare Improvement Program (SHIP) Format:

In order to provide hands-on QI learning to students a 15-week program was launched, with a total of 19 students having participated and 22 projects as of 2019. These positions were initially funded through Alberta Health Services. In 2019, SHIP was jointly funded by UofA's MD Program. An environmental scan and SWOT analysis were completed, and the Model of Improvement with 3 tests of change cycles was employed.

May – Y1/Y2 Students (based on availability) hired and receive EPIQ training. Students worked part-time with both a Sr. Quality Consultant (P. Mathura) and a medical doctor to support a QI project in the Edmonton Zone (EZ).

June/July – Students receive optional QI readings throughout the summer. Topics included change management, tools to evaluate QI changes and tips for approaching QI problems within healthcare. Throughout the summer, students work on QI project and have opportunities to attend quality council meetings, support other QI projects, attend QI presentations and connect with mentors. Students perform a test of change to determine the impact of proposed interventions.

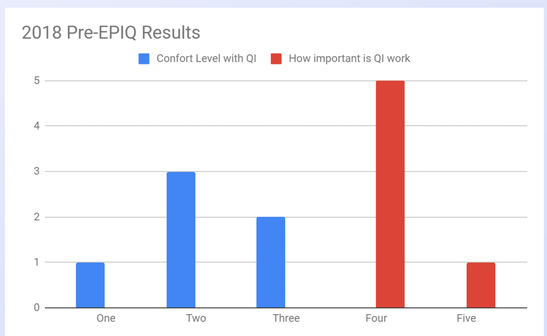
August – Students wrap-up QI project, create a poster presentation and participate in EZ QI Collaborative Day.

PDSA #1 (2017): 5 students were connected with quality consultant and physician lead and given EPIQ training. Limited formal coordination/pilot year.
PDSA #2 (2018): 8 students, formal QI student orientation with streamlined project outlines for each student. Standardized reading list, poster/abstract template and timelines for the program.
PDSA #3 (2019): 7 students, funding/mentorship support from UA UME

To assess the SHIP program/EPIQ training, a pre-survey and post-survey was used. Information on EPIQ can be found at www.epiq.ca

All students who responded to the surveys from 2017, 2018 and 2019 indicated that there is a deficit in undergraduate medical education when it comes to Quality improvement. (4 or above)

Figure 1 (right) shows the Pre-EPIQ results for 2018 (n=6), with answers for comfort with QI principles (blue) and beliefs on importance of QI (red).



RESULTS / PROGRAM ANALYSIS

Evaluation of EPIQ Training (Survey Results)

72% of all respondents ranked the skill and knowledge increase they took away from EPIQ as 4 or higher.
Many students cited the skills learned in EPIQ as beneficial to their future careers.
Students described EPIQ as an engaging and effective tool for teaching QI.

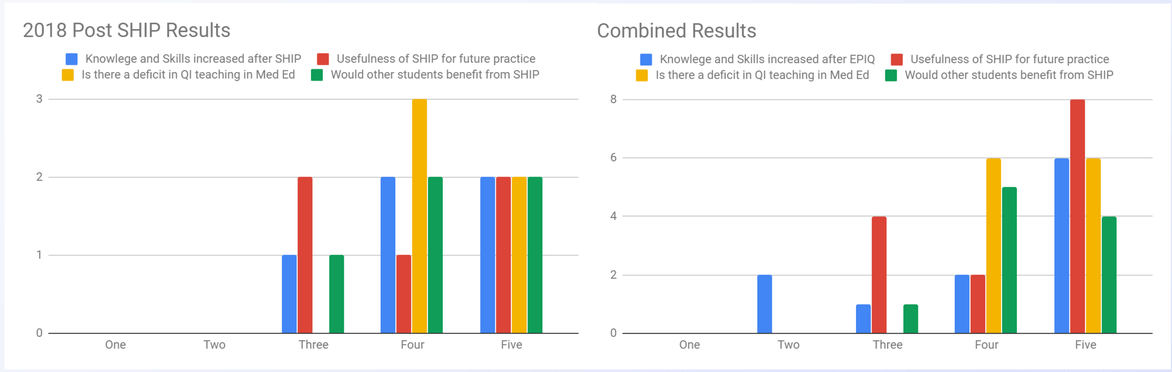


Figure 2a. Post SHIP Experience survey rating increase in knowledge, perceived deficit and belief of benefit for other students (n=5). 2b shows data over the three years for the same questions (n=14).

Evaluation of SHIP Program (Survey Results)

90% of students who responded to the surveys in 2017-2019 thought their peers could benefit from participating in SHIP (4 or above).
71% of the respondents thought their SHIP experiences would be useful in future practice. (4 or above)
Overall, students expressed a desire to learn more about QI and were engaged when given the opportunity to learn more. It was felt that EPIQ and SHIP demonstrated the need for QI education earlier in medicine.

Measures

Process: # of students/year, % of UM students in Y1 medical school, # projects completed, # QI posters at UA Celebration of Research day
Balancing: # of students whose projects extended into school year, # hours of added mandatory work for students

DISCUSSION / LIMITATIONS

Qualitative Feedback

Several key benefits and areas for improvement were identified based on feedback from students about their experiences in the SHIP program (right).

Benefits
- Increased QI knowledge and skill set as a result of comprehensive EPIQ training and hands-on QI involvement
- Flexibility of projects encouraged independent learning and at times, provided a chance to guide the project (ex. identifying possible strategies and choosing specific interventions to implement)
- Opportunity to work with various healthcare professionals in interdisciplinary teams
- Option to present findings at research events

Areas for Improvement
- Projects varied widely in terms of timelines, student expectations and publication capacity, making the experience hard to predict
- Student availability/summer schedule make adjusting QI project timelines difficult
- Limitation of participation to certain stages of QI process depending on the progress of a project at time of student assignment (ex. data collection, data analysis, and/or implementation planning)
- Inability to seek and work with a QI supervisor that is not associated with SHIP

LESSONS LEARNED

Lessons Learned:

- Students seek education on QI principles and are empowered to learn more about how to effectively implement and assess sustainable change
- Students prefer hands-on learning over didactic lectures, and appreciate being involved in QI projects
- EPIQ is an effective platform for teaching undergraduate students QI principles
- Having medical students lead QI projects can be difficult given the quick-pace of QI and the limited flexibility of student schedules
- Medical Students can make substantial impact on QI projects within the timeframe of a summer

Future Direction:

- We hope to continue to offer the SHIP program to provide medical students with an in-depth QI experience and introduce them to concepts in healthcare leadership
- UofA DoM and UME will continue to explore means of educating undergraduate students on QI principles
- We hope to develop a driver diagram to better assess what measures we should evaluate for the SHIP program and how we can improve

References and Acknowledgements

Brown, A., Nidumolu, A., Stanhope, A., Koh, J., Greenway, M., & Grierson, L. (2018). Can first-year medical students acquire quality improvement knowledge prior to substantial clinical exposure? A mixed-methods evaluation of a pre-clerkship curriculum that uses education as the context for learning. BMJ Quality & Safety Online First, 0, 1-7.
Collins, C., Mathura, P., Kassam, N., & Tapardel, A. (2018). Using Quality Improvement Methodology to Develop a Standardized QI Educational Curriculum for Internal Medicine Residents.
Teigland CL, Blasiak RC, Wilson LA, Hines RE, Meyerhoff KL, Viera AJ. Patient safety and quality improvement education: a cross-sectional study of medical students' preferences and attitudes. BMC Med Educ. 2013;13:16.
University of Toronto Department of Medicine. (n.d.). Training & Education. Retrieved from http://www.deptmedicine.utoronto.ca/training-education
W21C. (n.d.). Applied evidence based medicine in quality improvement (MDCN440). Retrieved from https://www.w21c.org/portfolio/applied-evidence-based-medicine-in-quality-improvement/

Special thanks to all medical students who participated in the program and provided feedback frequently; the University of Alberta Department of Medicine for supporting students participating in this program; Pam Mathura for coordinating and mentoring students over the summer; the University of Alberta Undergraduate Medical Education office for their commitment to improving QI education and their funding; and the Edmonton Healthcare Improvement Network (EHIN) for providing coordination/support to the program over the years