

SYSTEMATIC REVIEWS SUMMER COURSE IN LI KA SHING KNOWLEDGE INSTITUTE IN TORONTO: KING SAUD UNIVERSITY MEDICAL STUDENT'S EXPERIENCE

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Abstract- systematic reviews (SR) are considered to be the highest level of evidence among different research designs and it's defined by the Cochrane collaboration as attempts to collate all empirical evidence that fits pre-specified eligibility criteria in order to answer a specific research question. It uses explicit, systematic methods that are selected with a view to minimizing bias, thus providing more reliable findings from which conclusions can be drawn and decisions made.¹With this paper we would like to present our experience in this institution and offer our feedback on our time at the University of Toronto. Moreover, we hope to give a concise summary of what we have learned on systematic reviews for those who wish to explore this opportunity.

Index Terms- systematic reviews, experience, medical students, king SaudUniversity, opinion.

I. INTRODUCTION

Systematic reviews (SR) are considered to be the highest level of evidence among different research designs and it's defined by the Cochrane collaboration as "attempts to collate all empirical evidence that fits pre-specified eligibility criteria in order to answer a specific research question. It uses explicit, systematic methods that are selected with a view to minimizing bias, thus providing more reliable findings from which conclusions can be drawn and decisions made".¹The summer course program is a result from the extended collaboration between King Saud University along with Prince Naif Research center and Li Ka Shing institute for applied science at St. Michael's hospital affiliated with University of Toronto.

A. Prince Naif Center for Health Science Research

Prince Naif Centre for Health Science Research is an international research center located in Riyadh, Saudi Arabia. The center offers various facilities, which support research related to several fields of medicine; including stem cells, cancer, genetics, and molecular biology, among others.

The objective of Prince Naif Health center and King Saud University for this course is to provide a selected group of students interested in research with an opportunity to learn about this high quality study design.

B. Li Ka Shing Knowledge Institute

The Li Ka Shing institute of St. Michael's is a world-renowned research center that allows for leading researchers, educators, and clinicians to collaborate with the common goal of advancing current medical therapies and practice. The institute strives to bridge the gap between insight and impact by developing new knowledge-mobilization techniques

by applying proven strategies to ensure that results reach end-users.

C. Application process

All King Saud University fourth and fifth year medical students were given the chance to apply to the course held during the period from 1st June – 12th July 2015. Students were selected based on research interest, research achievement, GPA and finally the interview. The course was a 6 week course, held during the period from 1st June – 12th July.

D. Objectives

Objectives that should be met at the end of the course were: differentiate systematic reviews from other reviews, identify organizations that conduct systematic reviews, discern individuals who should be included in a SR team, distinguish between different types of evidence that can be summarized in a SR, develop a SR question, develop an eligibility criteria, develop a SR protocol, conduct SR under guidance and finally appreciate researchers and the effort that is put into systematic reviews.

II. FACULTY

See Table 1 and 2.

III. MODULES

A. Module source

Each student had an access to the online course provided. Each module was introduced with a 15-20 minute video of the PowerPoint slides with voiceover; the slides were available for download for our convenience. See Table 2, 3.

B. Reading materials

The reading material included both mandatory and optional material, which consisted of links to book chapters from the Cochrane handbook, the Center for Reviews and Dissemination and many others, together with academic articles related to the topic. The material would elaborate on the module in which it was included and provide a deeper understanding of each topic. As a group, we agree that the modules gradually increased in complexity, building on previous modules. This design aspect was one we

particularly appreciated as it allowed for gaps in knowledge to be filled, giving us a solid base of understanding on which we could build from our own experience when conducting a review.

Although we did find the review to be very well structured and informative, some of us think that one area on which improvement could be made is making the course more interactive. One way to accomplish this would be giving the presentations in a classroom, making it easier to ask questions as we go along.

Table1. Leaders and Designers of the Systematic Review Course

Full name	Title	Affiliations	Roles in Program
Dr. Andrea Tricco	Staff Scientist	Scientist, Knowledge Translation in the Li Ka Shing Knowledge Institute of St. Michael's Hospital Assistant Professor (status), Epidemiology, Dalla Lana School of Public Health, University of Toronto	Scientific Lead in delivering Knowledge Translation; plan development
Dr. Sharon Straus	Staff Scientist	Scientist in the Li Ka Shing Knowledge Institute of St. Michael's Hospital Director, Knowledge Translation program, Li Ka Shing Knowledge Institute at St. Michael's Hospital and University of Toronto Professor, Department of Medicine, University of Calgary Professor, Department of Medicine, University of Toronto Division Director, Geriatric Medicine, University of Toronto Professor (status only), Department of Health Policy Management and Evaluation, University of Toronto Principal Investigator, Knowledge Translation Program, University of Toronto	Scientific oversight in delivering Knowledge Translation
Monica Caverson	Research Manager, Knowledge Translation	Staff of St. Michael's Hospital, Toronto, Canada	Operational lead in implementing and delivering training program
Dr. Muhammad Mamdani	Director	Director, Applied Health Research Centre, St. Michael's Hospital Scientist in the Li Ka Shing Knowledge Institute of St. Michael's Hospital Associate Professor, Department of Health Policy, Management, and Evaluation, University of Toronto Associate Professor, Leslie Dan Faculty of Pharmacy, University of Toronto Adjunct Professor, King Saud University Adjunct Scientist, Institute for Clinical Evaluative Sciences	Co-Program Lead in KSU-LKSKI collaborative program
Dr. Mohammed Al-Omran	Staff Physician, Vascular Surgery	Scientist in the Keenan Research Centre for Biomedical Science of St. Michael's Hospital Head, Division of Vascular Surgery, St Michael's Hospital Professor, Department of Surgery, University of Toronto Professor, Department of Surgery, King Saud University, Riyadh, Saudi Arabia	Co-Program Lead in KSU-LKSKI collaborative program and KSU representative
Khalid Sabihuddin	Manager, Business Operations, Applied Health Research Centre	Staff of St. Michael's Hospital, Toronto, Canada	Operational lead in coordinating and managing training program

IV. ASSIGNMENTS

A. Questions & Answers (Q&As)

We were each required to come up with at least one question related to each module and provide an answer

to our questions along with its reference. This exercise encouraged us to explore the topics further and look for the answers ourselves. All of us also felt these questions contributed to a more stimulating discussion during our module review sessions.

B. Quizzes

A short online quiz, containing 5-10 multiple choice and true or false questions to test our understanding of the topic followed each module.

C. Standard Operating Procedures (SOP)

During our time in Toronto, we were introduced to the concept of Standard Operating Procedures (SOPs),

which are a set of written instructions for a routine activity detailing each step and the organization in which they should be performed, allowing for more standardized and streamlined workflow. With almost all modules we were asked to develop one or two topic related SOPs. We would work on these as a team and submit them with our questions. These were reviewed with the research coordinators during the meeting.

Table 2. Names & Qualifications of the leads of the Module Review Sessions

Full Name & Affiliation	Title	Qualifications*
Roberta Cardoso ¹	Dr.	PhD
Sonia Thomas ¹	Ms.	-MSc (Epidemiology & Biostatistics) -BSc. (Physiology & Psychology)
Wasifa Zarin ¹	Ms.	-MPH (Epidemiology) -BHSc. (Honours)nn
Huda Ashoor ¹	Ms.	-CCRP -BSc.
Alissa Epworth ¹	Ms.	-LIT (Library and Information Technician) Diploma
Jesmin Antony ¹	Ms.	-MSc. -BHSc.
Charlene Soobiah ^{1,2}	Ms.	-PhD (Candidate: Specialization in health services research) -HBSc. (Psychology & neuroscience)
Areti-Angeliki Veroniki ¹	Dr.	-PhD
Inthuja Selvaratnam ¹	Ms.	-BSc (Honours: Life Sciences)
Elise Cogol ¹	Dr.	-MSc (Candidate: Epidemiology) -MLIS -ND -BSc (Human biology, and Biology & Physics)
Erin Lillie ¹	Ms.	-MSc. (Epidemiology) -B.Sc. (Honours: Psychology)
Patricia Rios ¹	Ms.	-MSc. (Health Studies) -BHSc. (Honours)

*Abbreviations for Qualifications: BSc = Bachelor of Science; BHSc = Bachelor of Health Sciences; CCRP = Certified Clinical Research Professional; MSc = Master of Science; MPH = Master of Public Health; ND = Doctor of Naturopathic Medicine; PhD = Doctor of Philosophy; MLIS = Master of Library and Information Science.

Affiliations

¹Li Ka Shing Knowledge Institute of St. Michael's Hospital, 209 Victoria Street, Toronto, Ontario, M5B 1W8, Canada

²Institute for Health Policy Management and Evaluation, University of Toronto, Canada Health Sciences Building, 155 College Street, Suite 425, Toronto, ON M5T 3M6

V. MEETINGS**A. Knowledge translation (KT) team meetings**

KS meetings were held every Monday from 10 to 10:30 am. During these meetings, research coordinators would discuss their various research

projects with us, providing us with information on the current phases of ongoing studies and elaborating on the status of publication of completed projects. These meetings appeared to be beneficial and were appreciated by KT

members (research coordinators) in resolving issues regarding their ongoing projects. For us students these meetings provided us with a general idea of how to resolve operational challenges we may encounter when conducting our own review, as well as giving us some perspective on how a systematic review team is run. We were also given the opportunity to present and participate in these meetings as we progressed in the course, giving updates about our status in the online course and the stage of our project.

Table 3. Module No. and Titles

Module No.	Title
1	What is a systematic review?
2	Which organizations conduct systematic reviews?
3	Who is included in the systematic review team?
4	What type of evidence can be synthesized in a systematic review?
5	How do we formulate the systematic review question?
6	How do we develop the eligibility criteria for a systematic review?
7	How do we develop the systematic review protocol?
8	How do we search the literature in a systematic review?
9	How do we select studies for inclusion in a systematic review?
10	How do we appraise the methodological quality of studies included in a systematic review?
11	How do we abstract data in a studies included in a systematic review?
12	How do we conduct a meta-analysis in a systematic review?
13	How do we present the results of a systematic review?
14	How do we interpret the results of a systematic review?
15	What are the different types of bias that can influence the results of a systematic review?
16	How do we disseminate the results of a systematic review?
17	How do we update a systematic review?
18	How do we select the most appropriate knowledge synthesis method to answer our research question?

B. Modules revision meetings

The second type of meeting is a module review meeting, which would be facilitated by a different research coordinator for each module. During these meetings we would discuss each module in more details, review our Q&A as well as cover any other questions we may have had. We would also go over the standardized operating procedures, making improvements with the help of the research coordinators. These meetings were the most beneficial for our level compared to the other meetings as we were able to address questions faced throughout the course.

C. Meetings with Andrea

The last type of meeting is a one-hour meeting with the program instructor every Wednesday morning. Dr. Tricco would help to clarify any inquiries we had and answer questions we did not already cover with the RCs and offer advice and guidance on how to conduct our own systematic review.

VI. FACILITIES

Convenient work environment is known to be essential for productive work activities in general and educational scientific research activities in particular. Such environment was witnessed by us throughout the course in Li Ka Shing Research center as reflected in the following:

a. Providing students with study units equipped with all necessary facilities needed to accomplish work at

any time during the day, which helped focusing on duties.

b. Allowing student to use computer labs by which they had access to recent published researches and topics related to medical field.

c. The friendly atmosphere we have been through and the smooth relationship with the staff as we were provided with their emails to keep in touch at any time.

VII. KEY LESSONS

This summer course gave us the time and chance to improve different aspects of skills that foster medical research. Those skills include; working as a team, linking different resources of knowledge, exploring other learning environments and adapting with different methods of knowledge perception.

VIII. LIMITATIONS/RECOMMENDATIONS

With all the invaluable knowledge we gained we think that a hands-on experience would be a great opportunity to master what we've learned. This goal can be achieved by extending the duration of the summer course more.

CONCLUSION

In the end, we found this course to be a meaningful experience. In addition to expanding our own research

abilities, our time at the Li Ka Shing institute taught us to appreciate the amount of work and effort that goes into a systematic review. The dynamic between the team members was unforgettable and something we hope to apply in practice. We would also like to take this opportunity to thank everyone at the institute for all the help they've offered and making us feel welcome and comfortable throughout the course.

REFERENCES

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