

A Capacity-building Pilot Program to Increase Critical Care Research Productivity in the Middle East Region

Lama Nazer (✉ lnazer@khcc.jo)

King Hussein Cancer Center <https://orcid.org/0000-0002-7550-4751>

Ruth Kleinpell

Vanderbilt University

Keith Olsen

University of Nebraska Medical Center

Feras Hawari

King Hussein Cancer Center

Research note

Keywords: Research, Middle East, capacity building, education, critical care

Posted Date: July 8th, 2020

DOI: <https://doi.org/10.21203/rs.3.rs-40533/v1>

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Abstract

Objective

Though research is well established in the developed world, it lags behind in developing countries. We describe a multi-disciplinary, structured, mentor-based program that aimed to improve research skills and increase research productivity among critical care practitioners in the Middle East region.

Results

The program was conducted between October 2016 and September 2017, and enrolled 11 critical care practitioners (5 pharmacists and 6 physicians) with minimal research experience from 5 countries (Jordan, Saudi Arabia, Oman, Egypt, and Sudan). The program addressed three major factors that contribute to low research productivity in developing countries which include: lack of research knowledge and skills, lack of mentorship, and poor preparation of manuscripts. It started with a research proposal workshop and ended with a manuscript writing workshop, with monthly webinars throughout the year about research-related topics. The faculty consisted of 10 clinical instructors, among whom 7 also served as mentors, a biostatistician, and a medical editor. By the end of the program, 7 research projects and 5 manuscripts were completed. According to the program evaluation, participants agreed that the program improved their research skills and the quality of their research.

Introduction

Research is essential for effective clinical decision-making and for improving the quality of patient care. Though the Middle East region has made significant advances in healthcare, the proportion of resources allocated to research and the research output is generally low in all fields, including critical care[1–3].

Several factors contribute to this low research productivity which include lack of training in clinical research resulting in poor research skills, deficiency of local mentors, minimal financial resources, as well as lack of language proficiency and suboptimal writing skills being obstacles to publication in peer-reviewed journals [4,5].

In this report, we describe a structured research capacity-building program piloted in the Middle East and highlight the outcomes associated with the program as well as the challenges encountered.

Methods

This was a 1-year, multidisciplinary, structured, mentor-based program, developed and piloted by the Middle East Critical Care Assembly and supported by the Society of Critical Care Medicine. The main goal of this program was to improve the research knowledge and skills as well as enhance research productivity among critical care practitioners in the Middle East region.

Eligible candidates were health-care professionals practicing in the field of critical care in the Middle East who had limited research experience and demonstrated personal and institutional commitment to the program requirements. Applicants submitted a 1–2 page personal statement that described their interest in clinical research and a proposed research idea, along with a letter of support from their director/supervisor. Research ideas eligible for this program were those that could be completed within 4–6 months at the participant’s institution. Clinical interventional studies as well as multi-center studies were discouraged since the time required to prepare for and implement such studies would typically exceed the 1-year time-frame of the program.

Participants were required to develop and conduct their own research project at their local institutions, as well as complete a research manuscript. The program started with a research proposal workshop and ended with a manuscript writing workshop. Monthly webinars were conducted during which various research-related topics were presented. Each participant was assigned to a mentor who provided guidance throughout the program.

The research proposal workshop was conducted over 2 days in Jordan. The main goal was for participants to complete the proposal for the research idea that they had initially identified. The workshop faculty included clinical instructors and a biostatistician, all of whom had extensive experience in critical care research. The workshop consisted of several didactic sessions, small group discussions, 1:1 feedback, as well as individual work time for the participants to complete their research proposals. Table 1 briefly outlines the content of the workshop.

Table 1
Topics Covered During Program Workshops

Research Proposal Workshop	Manuscript Writing Workshop
Day 1	Day 1
Importance of clinical research Status of research in “our” region	Practical tips on presenting your conference poster
Ethics of research The IRB process	Poster Presentations Participants will present their research posters over 5 minutes, followed by questions and feedback from the other participants and instructors.
Elements of a research proposal The research question, hypothesis & objectives Defining the rationale for your research	Practical tips on medical writing
Individual Work Formulate your own research question and describe your rationale	Small Group Discussion Journal Selection, Title, Abstract, Keywords
Group Discussion Present your research question and rationale	Small Group Discussion Introduction
Research Methodology	Individual Work
Designing and conducting survey research	Revise abstract and introduction sections of the manuscript based on feedback received during the group discussions.
Individual Work Complete your research objective, research design, methods, end points, and target patient population.	
Group Discussion Participants present their research objectives and methods	
Day 2	Day 2
Data collection and analysis	Small Group Discussion Materials & Methods

Research Proposal Workshop	Manuscript Writing Workshop
Group Discussion Discuss your statistical analysis plan with the biostatistician for feedback.	Small Group Discussion Results
Individual Work: Complete study proposal and prepare brief presentation.	Individual Work Revise methods and results sections of the manuscript based on feedback received during the group discussions
Group Discussion: Research proposal presentations	Small Group Discussion Discussion, Acknowledgment, and References
Research limitations	Day 3
Determining your study co-investigators	The submission and publication process
Roles and responsibilities of the principle investigator and co-investigators. Determining authorship	Individual Work Revise the manuscript based on the feedback received from clinical instructors and medical editor.

Following the workshop, each participant was assigned a mentor to provide guidance and support throughout the program in developing and conducting the research project. The mentors were critical care practitioners with extensive experience in critical care research and in publishing. Since the mentors and mentees were in different countries, they communicated through emails and through online meetings.

The manuscript writing workshop was conducted over two and a half days in Jordan. Participants were required to have their initial draft of the manuscript completed prior to the workshop. The main aim was for participants to complete the final draft of their research manuscript. The faculty included clinical instructors and a medical editor. Participants were divided into groups of 3–4, with one clinical instructor for each group who discussed each section of the group’s manuscripts with the participants and provided feedback. The medical editor rotated between the groups and had 1:1 meetings with each participant to improve the writing of the manuscripts. In addition, once the final draft was completed, the medical editor completed final editing of the manuscript prior to submission. Table 1 briefly outlines the content of the manuscript writing workshop.

At the end of the program, participants were asked to complete an evaluation form to determine their level of satisfaction with the content and structure of the program and the impact of the program on their research skills.

Results

This program was conducted between October 2016 and September 2017, and enrolled 11 participants (5 pharmacists and 6 physicians) with minimal research experience from 5 countries (Jordan, Saudi Arabia,

Oman, Egypt, and Sudan). The faculty consisted of 10 clinical instructors, including physicians, pharmacists, and a nurse, among whom 7 also served as mentors, a biostatistician, and a medical editor. By the end of the program, 7 research projects were completed, 1 was still ongoing, 2 were stopped due to difficulties in the implementation, and 1 was stopped due to work-load. At one year following the manuscript writing workshop, 5 manuscripts were completed and submitted, one was still in-progress, and one was terminated prior to completion due to work-load.

The program evaluation was completed by all participants. Participants were satisfied with the content and structure of the program and agreed that it improved their research skills and the quality of their research. The main limitation was the time necessary to complete the requirements of research once they returned to their practice sites.

Discussion

In this report, we describe a clinical research training program that aimed to increase the research knowledge and skills as well as research productivity among critical care clinicians in the Middle East region. The program addressed three major factors that contribute to low research productivity in developing countries which include: lack of research knowledge and skills, lack of mentorship, and poor preparation of manuscripts [4,5]. This was a pilot program and therefore included a relatively small number of participants. Nevertheless, it describes a promising model with unique elements that may be incorporated into future capacity-building programs in developing countries.

An important element of this program was having the participants apply the research skills through development and implementation of a research project at their local institutions. This helped participants better understand the research process and the application at their local settings. In addition, having an assigned accomplished research mentor whom the participants could contact for any questions or guidance helped participants to address any issues they faced and to successfully complete their research projects.

A unique aspect of the program was the inclusion of a biostatistician and medical editor in the faculty. Including a biostatistician in the proposal writing workshop helped the participants understand data analysis and determine the most appropriate statistical tests and analysis to include in their research proposals. However, the biostatistician did not provide support throughout the program, which we realized was a limitation, since most participants did not have biostatisticians at their institutions and therefore had difficulties with data analysis.

The goal of including a medical editor was to enhance the writing skills of the participants, which is considered as one of major obstacles to publication among researchers in whom English is not their native language. Though we could have sent manuscripts for medical editing once completed, our goal was for the participants to learn how to improve their scientific writing by having group and 1:1 discussions with the medical editor who explained how to improve the content and structure of each manuscript.

Several challenges were identified which impacted the ability to complete certain requirements of the program. The first was related to the completion of the study proposal in the first workshop. For a few participants, new research ideas had to be identified during the workshop and therefore, those participants left the workshop without completing their study proposal which impacted the completion of other aspects of the program. We had anticipated around 4–6 weeks from the time of protocol submission to research approval. However, there were certain local logistical issues which were not accounted for in the program schedule such as extensive time required for approval from the institutional review board, departmental approvals, and revisions from co-investigators. Additionally, the time required to complete the research extended beyond the timeline set for the projects due to the participants' clinical responsibilities. Though participants had letters of support from their directors/supervisors, they were all practicing clinicians who had minimal research-protected time. Finally, a few participants had difficulties covering the travel cost for the workshops. The Middle East Critical Care Assembly provided financial support to those participants but this issue would need to be considered when implementing larger programs.

Several research capacity-building programs have been described but few have evaluated the impact of such programs on research output. The American Thoracic Society and the NHLBI-United Health Collaborating Centers of Excellence described large programs conducted over several years that contributed to increase in research productivity [6,7]. Programs that target an increase in research productivity generally require several years to demonstrate such impact but would also require significant financial and human resources to support such goal, which is not always achievable in resource-limited countries. Developing local mentors and instructors is the key to ensure the continuity of research capacity building program.

Limitations

- The program included a relatively small number of participants.
- The impact of the program was evaluated up to 1 year after its completion.
- Though this was a multi-disciplinary program, participants included only physicians and pharmacists.

Declarations

Ethics approval and consent to participate: Human Research Subject determination was sought from the institutional review board of King Hussein Cancer Center and this was considered as a research that does not involve human subjects and does not require ethical approval or consent.

Consent for publication: Not required

Availability of data and materials: All data and material can be obtained by contacting the corresponding author.

Competing interests: None

Funding: None

Authors' contributions: LN developed the program and RK, KO, and FH reviewed the program and provided input prior to implementation. All authors contributed to the implementation of the program and assessment of outcomes. In addition, all authors contributed to the manuscript writing and review, as well as read and approved the final manuscript.

Acknowledgments: The authors would like to thank the Society of Critical Care Medicine for their support of this program and all instructors and mentors for making this program a success.

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