

Student-Driven Approaches to Undergraduate Medical Research: A Peer-Led Symposium

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ABSTRACT

Exposure to research early in medical school facilitates the development of physician-scientists and competent clinicians. In the last decade, institutions have established programs and policies to address the physician-scientist shortage. However, student-led initiatives to promote medical student engagement in research remain unexplored. This paper presents the design and results of the third iteration of a symposium in which senior medical students provided guidance and advice to preclinical students interested in research. It also reviews the lessons learned from three years of conducting the symposium.

KEYWORDS: undergraduate medical education, research, peer-assisted learning

INTRODUCTION

Medical school is a crucial entry point into academic medicine and research.¹⁻⁸ Since the identification of the physician-scientist shortage,^{1,2} institutions have sought to increase student involvement in research through initiatives such as physician-scientist training programs and MD/PhD tracks, which offer consistent research opportunities throughout medical training and prepare students for dual roles in biomedical research and clinical practice.²⁻⁶ However, peer-assisted learning (PAL), which has been used across many facets of medical education including academic tutoring,^{9,10} clinical exam skills,^{10,11} and evidence-based clinical practice,^{12,13} has not been formally explored in the context of research despite recommendations to promote student-led research education.¹⁴ The timing of student exposure to research is also critical: most students who participate in research begin their projects in the first two years of medical school.⁸ Hence, it is important to provide mentorship and guidance for research early in preclinical education. Finally, student participation in research-related activities develops skills in written and oral communication, teamwork, and problem-solving, which are transferable to clinical practice regardless of future research involvement.^{15,16}

We sought to promote early research exposure at our institution by evaluating the needs of preclinical (first- and second-year) students and establishing an annual student-led symposium featuring senior medical students who provided

guidance and advice to students interested in research.¹⁷ In this paper, we present the design and results of the third iteration of this symposium and review lessons learned from three years of conducting the symposium.

METHODS

With the support of experienced faculty advisors, we planned each symposium with four primary considerations: choosing topics, selecting fourth-year student panelists with research experience, structuring question and answer (Q/A) sessions, and incorporating post-course feedback. For the second and third symposia, we used a needs assessment – with attention to the perceived, expressed, and relative needs of students at our institution¹⁸⁻²⁰ – to define goals within each of the four areas. We surveyed all preclinical students with open-ended questions soliciting topics of interest, used feedback from the prior year's post-symposium survey, and quantified the amount of prior research experience among students to facilitate the selection of diverse student panelists.

The needs assessment helped guide the evolution of the symposia. At the first symposium, the student panelists gave advice on pre-determined topics and answered questions directly from the audience.¹⁷ In response to feedback from attendees, the second symposium tailored topics to student preferences, incorporated live online question and answer (Q/A) sessions, and included a post-symposium survey. The third symposium built on these improvements and incorporated three additional modifications based on survey results: (1) discussion of obstacles to successful research in addition to general advice; (2) selection of panelists based on student interests; and (3) post-symposium follow-up through additional peer contacts.

The third symposium incorporated our lessons learned to date. We designed the symposium based on results from a survey of all preclinical students regarding past research experience, current research interests, and suggestions for potential symposium topics. We selected the four major topics of the symposium according to student preferences, with emphasis placed on the relative needs of students with little research experience. For each topic, we advised panelists to discuss overcoming any obstacles ("pitfalls") they faced in addition to providing general advice ("pearls"). In contrast to previous symposia, we selected our peer panelists by surveying all fourth-year medical students about their research

experience, publication history, and research interests. We chose four panelists that reflected the stated project interests noted in the pre-symposium student surveys and provided diverse perspectives in research and publication. We addressed audience questions following discussion of each main topic using an online voting system (Mentimeter, Stockholm, Sweden). The allotted time for the symposium was one hour. Following the symposium, we electronically surveyed all attendees for feedback and gave them access to a database containing fourth-year student projects and contact information.

RESULTS

The pre-symposium survey was completed by 35% (92/264) of preclinical students. Respondents' past research experience included poster (53%; 49/92) and oral (26%; 24/92) conference presentations, co-authorship on a publication (42%; 39/92), and first-authorship on a publication (16%; 15/92). The most requested topics were selecting a mentor (79%; 73/92), choosing a project (59%; 54/92), project management (50%; 46/92), and time management (41%; 38/92) (**Figure 1**).

Nineteen percent (50/264) of first- and second-year students attended the symposium. We selected four fourth-year student panelists with previous publications in peer-reviewed journals and interests in emergency medicine, internal medicine, obstetrics and gynecology, and ophthalmology. They discussed "pearls" and "pitfalls" regarding the four main topics. Questions raised during the Q/A section ranged from research basics ("Who needs to submit an IRB? What is an IRB?") to logistics ("How do you ask about the potential productivity of a project without sounding demanding? If you get a project outside of our institution, how do you maintain the project and mentorship during the school year?") to advice on the value of research ("How important is doing research in the specialty that you ultimately

choose? Is social science research less valued than clinical/bench research for residency applications?").

Forty-four percent (22/50) of attendees completed the post-symposium survey. Respondents found Q/A sessions most helpful (45%; 10/22), followed by "pearls" (36%; 8/22) and "pitfalls" (32%; 7/22). Students commented that they wanted longer Q/A sessions. Others requested more personal discussion from panelists about the process of beginning research and their individual experiences. On a scale from one to ten, students rated the symposium a mean of 7 in terms of helpfulness in addressing their questions about research.

DISCUSSION

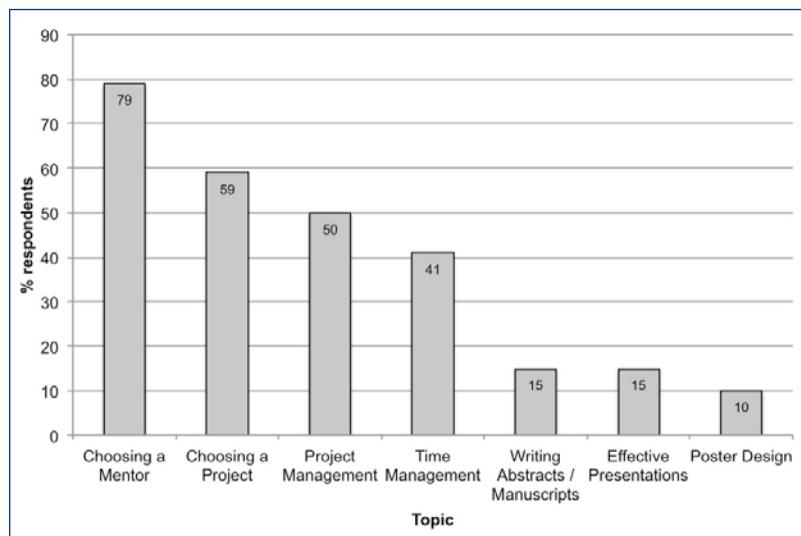
Our annual symposia aimed to provide an early entry point into research for preclinical medical students using an interactive PAL model. Based on our needs assessment, we found that half of preclinical students had previous experience presenting posters (53%; 49/92); however, requested topics of discussion largely included basics such as selecting mentors (79%; 73/92) and choosing projects (59%; 54/92) rather than advanced research topics such as writing manuscripts (15%; 14/92). Thus we selected symposium topics based on students' expressed interests with focus on guiding those with little to no research experience.

Overall, students found the third symposium effective in introducing the logistics and skills of beginning research. They rated Q/A sessions to be the most helpful, a theme strongly supported by feedback gathered from the prior symposia. Students requested more time for panelists to speak in-depth about their personal experiences, suggesting that students highly value learning from peers. We can maximize the PAL model by continuing to allocate more time to Q/A and soliciting specific questions for panelists before each symposium. Similarly, developing separate symposia for students based on past research experience as a follow-up

series to the initial symposium would address the concerns of a broader array of students. For example, a symposium for students with little research experience could discuss the IRB process in greater depth while a symposium for advanced students may focus on writing and publishing manuscripts.

Limitations of the symposia include time constraints precluding in-depth discussion of all topics, tailoring the presentation to a general rather than a specific group of students (e.g., based on prior experience), and conflicting advice from panelists. In addition, the feedback expressed in surveys may not have been representative of all of students' concerns given our low response rate. With each year's iteration of the symposium, we have addressed some of these limitations by ensuring better adherence to the predetermined schedule and adding a

Figure 1. Requested topics of discussion on pre-symposium survey (N = 92)



pre-symposium rehearsal to allow panelists to streamline their presentations. As we build upon the annual series, we will facilitate continuity by maintaining communication between each year's symposium leaders. We will also examine trends in research involvement and attitudes toward research at our institution to assess the long-term efficacy of our symposia.

To increase student involvement in research, numerous institutions have trained clinical faculty, incorporated research experiences into the medical curriculum, and ensured the availability of mentors.^{4,5} To our knowledge, this is the first student-led initiative that proposes to meet this objective by taking advantage of readily available institutional resources. Our rationale is that programs are irrelevant unless they inform students – the primary stakeholders – about how to use resources already available at their institution. The student-led symposia address barriers to entering research by providing preclinical students early guidance on research at our home institution and beyond. Our PAL model is also easily reproducible at other medical schools aiming to expand their research curricula.

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Disclaimer

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