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Describing the Breadth and Scope of Keck Medical Student Primary Care Research Projects

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Abstract

Introduction: Primary care research is an important field of study within medicine, but little research has characterized medical students' projects on this topic. Second-year medical students at the Keck School of Medicine (KSOM) of University of Southern California are required to complete a research project on a topic of their choice. This study seeks to describe the scope of primary care medical student research conducted by KSOM medical students and specifically Primary Care Program (PCP) pipeline students. The PCP consists of students with a vested interest in primary care, and who we hypothesize are more likely to complete a primary care project.

Methods: To assess students' primary care (PC) research output, we reviewed and sorted 1,408 KSOM abstracts between 2014 and 2020 into PC or non-PC. PC projects were then recategorized into more specific PC topics. χ^2 analysis determined significance at $P<.05$.

Results: We reviewed abstracts from 1,408 KSOM medical students (n=122 PCP; 1,286 non-PCP). Results revealed that the number of PC research projects conducted by 122 PCP students (67.2%, n=82) was statistically significantly higher than by 1,286 non-PCP students (14.7%, n=189, $P<.00001$). The most common PC research topics (n= 271) were education (patient/medical, n=71, 26%), health diversity/disparities (n=60, 22%), mental health/psychiatry/behavioral science (n=58, 21%), and community medicine (n=48, 18%).

Conclusions: Our study describes the breadth and scope of Keck medical student PC research. Supporting PC research efforts by medical students may increase the proportion of students conducting PC research, students choosing PC careers, and faculty producing PC scholarship.

Introduction

Many students choose to conduct primary care research (PCR) projects. PCR can broadly be defined as research in the context of primary care (PC). More specifically, it includes basic, clinical, health services, health systems, and educational research.[6] PCR recognizes the health system's multifaceted nature, the socioenvironmental factors impacting patients, and provides evidence for quality improvements and health education.[7-10] PC evidence regularly informs global clinical guidelines.[11] Engaging students in scholarship advances research output and may encourage interest in PC specialties.[12] This is crucial because the United

States will lack up to 50,000 primary care physicians by 2030.[12] Despite its importance, there is limited literature on medical student PCR projects. One of the few published studies, from the University of New South Wales, found that 15.5% of students conducted PCR projects, with common themes being mental health and/or substance abuse, older adult care, common chronic diseases, and health issues facing diverse communities.[13]

At the Keck School of Medicine (KSOM) of University of Southern California (USC), second-year medical students must complete a required scholarly project (RSP), that culminates in an abstract and poster forum. These KSOM faculty-mentored research projects can be in a discipline of each student's choice and many students choose projects based on existing mentors, research interests, and research fairs.

Among KSOM medical students, those interested in PC can apply to be part of the Primary Care Program (PCP) at matriculation.[14] This pipeline program has grown since 2011 from 12 to 32 students per year and provides longitudinal PC experiences, including exposing students to PC community-based clinics, lifestyle counseling, PC skills-based teaching, and mentorship. PCP students may be more likely to complete a PCR project because of their predisposed interest in PC and access to PC mentors.

Our study seeks to describe the scope of PCR conducted by KSOM medical students, and specifically look at PCR projects completed by both PCP and non-PCP students.

Methods

Each year, approximately 186-second year KSOM students complete an RSP. All RSP abstracts are compiled into an annual book. The abstracts from 1,408 individual students were reviewed from 2014 to 2020 by two study team members independently and characterized as PC or non-PC research based on title and content. PCR projects must have met the PC definition, specifically including basic, clinical, health services, health systems, and educational research in the PC context.[6] Non-PC projects included research conducted in the hospital and about diseases commonly addressed by specialists (ie, neuro-oncology, tumors, etc). The interrater reliability for PC vs non-PC categorization was 91%.

PCR projects were then recategorized into one to two distinct PCR topics using a priori categorization. The final 16 PC topics were derived from the 57 initial categories in the RSP abstract books (Table 1). Non-PC categories (ie, gastroenterology, neurology, etc) were excluded. Two study team members collaboratively decided upon PC topic recategorization. After recategorization, we separated PCR projects conducted by PCP students for analysis.

χ^2 analysis determined significance at $P<.05$. USC's institutional review board classified the research as exempt.

Results

We reviewed 1,408 individual KSOM student RSPs and 271 students (19.2%) completed PCR projects. Among the 122 PCP students, 67.2% (n=82) completed a PCR project and among the 1,286 non-PCP students, 14.7% (n=189) completed a PCR project ($P<.00001$).

We categorized the PCR projects by topic(s). Among 271 PCR projects, 435 topic assignments were made, indicating that just under half of the abstracts received two categorizations. The most common PCR topics (n=271) were education (patient/medical education, n=71, 26%), health diversity/disparities (n=60, 22%), mental health/psychiatry/behavioral science (n=58, 21%), and community medicine (n=48, 18%, Table 2).

Conclusions

PCR is broad and addresses the health needs of the general population.[7,8] Despite its importance, however, there is a significantly lower rate of PCR output when compared to more specialty-focused disciplines.[15]

In order to foster PCR, it is important for primary care physicians to be equipped with research skills, which is not typically a focus of residency training.[16,17] Providing PCR opportunities and support for students may increase the research pipeline. In this study, 14.7% (n=189) of non-PCP medical students and 67.2% (n=82) of PCP students conducted PCR projects. The proportion of PCR projects conducted by all KSOM medical students (19.2%, n=271) is similar to the University of New South Wales (15.5%), but may be higher because of the PCP.[13]

Describing the scope of PCR highlights its impact on patient and population needs. Among the PCR projects, education (patient/medical), health diversity/disparities, mental health/psychiatry/behavioral science, and community medicine were common topics. These topics represent PC's broad pillars. Also consistent with New South Wales, a significant proportion of projects researched health diversity/disparities.[13] Many projects also focused on two PC topics, showcasing the field's multifaceted nature.

Our study had some limitations. Although care was taken to uniformly identify PCR topics, recategorization may have inadvertently misclassified some projects. We were not blinded to the abstract authors, which may have introduced unintentional bias. PCR projects were limited to two subcategorization topics, which we felt sufficiently categorized nearly all the abstracts. Finally, students were required to have a USC research sponsor/mentor, which may have limited community-based PCR opportunities.

This is one of the first studies to look at and further describe PCR conducted by US medical students. Future research would benefit from evaluating whether medical school investment into PCR can increase the proportion of students conducting PCR, choosing PC careers, and PC scholarship output. There may also be PCR topics not as readily available for medical students, such as clinic data internal metrics, that could be further explored. Supporting medical student PCR may help develop future primary care physicians with research skills utilized throughout their career.

Tables and Figures

Table 1: Research Categories From RSP Abstract Books and Final Primary Care Categories

All RSP Categories (n=57)	Primary Care Categories (n=16)
Alternative medicine	Community medicine
Anesthesiology	Education (patient/medical education)
Basic science	Family medicine
Behavioral science	Gerontology/palliative care
Biokinesiology and physical therapy	Health diversity/disparities
Cardiology/cardiovascular	Health technology
Clinical	Healthcare economics
Community medicine	Integrative health/alternative medicine
Dean's research scholars	Internal medicine
Dentistry	Mental health/psychiatry/behavioral science
Dermatology	Obstetrics & gynecology/reproductive health
Education	Patient quality/safety
Emergency medicine & trauma	Pediatrics
Endocrinology	Preventive medicine
Epidemiology	Public health/epidemiology
Family medicine	Social work
Gastroenterology	
Genetics	
Gerontology	
Health diversity/disparities	
Healthcare economics	
Hematology	
Imaging	
Immunology	
Integrative health	
Internal medicine	
Medical education	
Mental health/psychiatry	
Nephrology and urology	
Neurology	
Neuroscience and physiology	
Neurosurgery	
Obstetrics & gynecology	
Oncology	
Ophthalmology	
Orthopedic surgery	
Otolaryngology	

(continued on next page)

Table 1: Continued

All RSP Categories (n=57)	Primary Care Categories (n=16)
Palliative care	
Pathology	
Patient education	
Patient quality/safety	
Pediatrics	
Pharmacology and pharmaceutical sciences	
Physiology and neuroscience	
Plastic surgery	
Preventive medicine	
Psychiatry	
Public health	
Radiation oncology	
Radiology	
Reproductive health	
Social work	
Stem cell biology & regenerative medicine	
Surgery	
Technology (health, technology, and engineering)	
Translational	
Trauma and acute care surgery	

Abbreviation: RSP, required scholarly project.

Table 2: KSOM RSP Primary Care Project Category 2014-2020

Primary Care Research Categories (2014-2020)	
Primary Care Research Topic	**Number of Projects With Topic**
Education (patient/medical education)	71 (26%)
Health diversity/disparities	60 (22%)
Mental health/psychiatry/behavioral science	58 (21%)
Community medicine	49 (18%)
Health technology	36 (13%)
Pediatrics	31 (11%)
Public health/epidemiology	31 (11%)
Obstetrics & gynecology/reproductive health	30 (11%)
Patient quality/safety	25 (9%)
Gerontology/palliative care	22 (8%)
Healthcare economics	15 (6%)
Preventive medicine	6 (2%)
Integrative health/alternative medicine	1 (0.4%)
Internal medicine*	0 (0%)
Family medicine*	0 (0%)
Social work*	0 (0%)
Total Projects	**271**

Abbreviations: KSOM, Keck School of Medicine; RSP, required scholarly project.
* This category is included in the table because it is considered primary care research[6]; however, all projects originally within this category were redistributed into more specific primary care topics throughout the table.

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