

MEDICAL SCHOOL HOTLINE

Promoting Medical Student Research Using a Searchable Database of Research Projects at the John A. Burns School Of Medicine

Trevor Grace BS; Rachel Arakawa BA; Yawen Sarah Hsiao MSIS; Shannon Hirose-Wong PhD; and Reid Hoshide MD, MPH

The Medical School Hotline is a monthly column from the John A. Burns School of Medicine and is edited by Satoru Izutsu PhD; HJMPH Contributing Editor. Dr. Izutsu is the vice-dean of the University of Hawai'i John A. Burns School of Medicine and has been the Medical School Hotline editor since 1993.

Participation in research activities while in medical school is endorsed by medical students.¹ Curricular programs aimed at supporting medical student research have been effective and well received.^{2,3} Research support is provided on a multitude of fronts, including central coordination by the office of medical education, faculty-student matching, financial support, and tailoring projects sensitive to student schedules. Students are able to build meaningful relationships with faculty mentors and develop systematic thinking, data analysis, and literature review skills. In addition, research is a means for students to contribute to their area of interest by demonstrating a zeal for scientific inquiry, thus enhancing their competitiveness for residency positions.^{4,5} For those willing to commit the time, participation in research is an invaluable medical school experience.

Medical students founded the Research Interest Group (RIG) at University of Hawai'i John A. Burns School of Medicine (JABSOM) to improve medical student access to research opportunities. An informal survey, conducted in 2010, indicated high levels of research interest and participation amongst JABSOM medical students. Students also desired more research opportunities in clinical, community health, primary care, and community outreach.⁶ RIG continues to provide educational opportunities through a series of research seminars and strives to streamline the research process for all medical students.

The purpose of this study was to assess medical student support for an online, searchable, and continually updated database of research opportunities at JABSOM. In addition, information on student satisfaction with current resources for research opportunities was collected.

Methods

Approval for this study was obtained from the University of Hawai'i Committee on Human Studies. In 2011, JABSOM medical students across all for four years were sampled using an anonymous online survey. The survey consisted of questions related to student's demography, prior research experiences, and Likert-scale statements that explored their feelings toward current resources for finding research projects. Univariate analyses followed by ordinal regression models were utilized to discover the level of satisfaction with current JABSOM resources and

to determine the support for an online, searchable database of research projects. Statistical analysis was done using SPSS (IBM SPSS Statistics).

Results

One hundred and nine JABSOM medical students responded to the survey (Table 1).

	MS1	MS2	MS3	MS4	Total
Number Responding	31	32	25	21	109
Mean Age	23.9	25.5	26.2	27	25.5
% Male	45.2	56.3	58.3	38.1	50
Prior Research Experience*	27	30	21	15	93
Current Participating in Research	8	19	16	20	63
Support for Database	30	32	21	21	104

MS1 = First Year Medical Student; MS2 = Second Year Medical Student; MS3 = Third Year Medical Student; MS4 = Fourth Year Medical Student. *Research experience before medical school

One hundred and four of the respondents (97%) agreed that an online searchable database of research projects would be beneficial when searching for a research mentor and project. Female students were more supportive of a research database than male students ($P = .021$). The first and second year students stated that they were more likely to use a database compared to the upperclassmen ($P = .001$, $P = .037$ respectively). Compared to students in their clinical years, first and second year medical students also believed that a research database would encourage students to conduct research projects ($P = .002$; $P = .025$, respectively). Furthermore, students without prior research experience were less satisfied with their search for research opportunities compared to students with a prior research experience ($P = .038$).

Discussion

With the implementation of JABSOM's Problem Based Learning Curriculum in 1989, first year medical students were required to conduct a community-based research project during the summer between their first and second year of medical school. In

1999 and under Dean Edwin Cadman's leadership, there was a dramatic increase in research grants and contracts awarded to JABSOM's faculty members. As a result, the MD Program Committee (now called the Curriculum Committee) implemented a change in the student research requirement. Students were encouraged to work closely with a research mentor during their first year of medical school and to implement, analyze, and present their research in years 2, 3, and 4. In conjunction with this directive, Dr. Stephen Seifried developed an online research database to assist students with finding a research mentor.⁷ This database was discontinued in 2005 when JABSOM moved to its new campus in Kaka'ako.

The Class of 2008 was surveyed by Dr. Sheri Fong at the end of their fourth year about their research productivity while at JABSOM.⁸ There was a response rate of 88% (50 of 57 students), and 64% of the respondents (32 of 50 students) had either published or presented their work, submitted their work for publication or presentation, or had abstracts or manuscripts in progress. Students presented their research at local, national, and international conferences, and published in nationally recognized journals indexed by the National Library of Medicine.

The required research experience was discontinued in June of 2008 and replaced with a summer research elective in MD5 (summer electives) for the Class of 2011.⁹ This change in curriculum was implemented to allow students more flexibility in planning their summer courses, for example, opportunities for international travel. With the restructuring of the research curriculum, the Class of 2011 became the first cohort to complete the summer research elective. Dr. Fong hypothesized that the revised curriculum would still allow research-oriented students to develop valuable research opportunities. The Class of 2011 was surveyed in May of 2011 about their research productivity under the revised curriculum. There was a response rate of 80% (45 of 56 students). Preliminary data, presented at the annual meeting of the Association of American Medical Colleges (AAMC) Western Group on Educational Affairs in 2012, indicated that although the percentage of students who participated in research had dropped, the overall research productivity (as measured by the number and quality of papers published and number of presentations given) was greater than the Class of 2010, the last class who had the research requirement (data not shown).⁹

Encouraging medical student research will help to address the need for more physician-scientists.^{10,11} Research principles are also clinically applicable, particularly translational medicine and clinical trial studies.¹² In addition, students' research achievements reflects highly on one's home institution and community.⁵ Therefore, if JABSOM supports research during the preclinical years students will be more likely to pursue careers in academic medicine.

In this current study, 95% of the respondents were in favor of developing an online, searchable database of research opportunities. First and second year medical students, who expressed an interest in using the database and felt the database would encourage preclinical students to conduct research compared to

students in their clinical years (data not shown). In addition, this study suggested that a research database would help improve access to research opportunities, especially for students without prior research experience.

It is concluded that an online, searchable database of research opportunities would be well received and utilized by JABSOM medical students. Future studies could assess the success of the database in satisfying student research goals as well as the database's influence on the early participation in research activities.

Research-enrichment activities in the medical school curriculum are an important means of fostering medical student interest in research careers.¹⁰ Currently there is little evidence in the literature regarding the effectiveness of a centralized, searchable database of research opportunities for increasing medical student involvement in research. Therefore, the continued assessment and evaluation of the database's usage by both students and faculty would be helpful in refining and modifying the research opportunities at JABSOM.

As a result of this study, Yawen Sarah Hsiao, Office of Medicine Education (OME), developed a searchable online database. It was placed online in December 2012. Researchers at JABSOM are now able to post online research opportunities for medical students. Each submission is first crosschecked with the faculty member's Department and upon approval, the opportunity is added to the database. Database listings provide students with information about the project, contact information, application deadlines, location of project, and level of expected commitment. Students can then contact the principle investigator for more information. As of this date, thirty-seven entries representing 61 research projects are available to students (Table 2). The address for OME's database is <http://omejabsom.com/research/>. Hopefully, JABSOM faculty members will continue to support

Table 2. Research Project Entries by Department, as of October 12, 2103.

Department	# of Entries	# of Projects
Anatomy, Biochemistry, Physiology	4	4
Cell and Molecular Biology	11	13
Complementary and Alternative Medicine	2	2
Family Medicine and Community Health	2	12
Geriatric	1	1
Medicine	2	7
Obstetrics, Gynecology & Women's Health	4	4
Pathology	1	3
Pediatrics	2	2
Psychiatry	2	4
Office of Public Health	2	2
Surgery	1	2
Tropical Medicine, Medical Microbiology & Pharmacology	3	5
Total	37	61

this database. Through the Research Interest Group, students are encouraged to periodically search the site for research opportunities (for more information about the database, contact Dr. Shannon Hirose-Wong in the Office of Medical Education).

Study Limitations

The cross-sectional design of this study means that the findings are associations rather than causations. These findings are not generalizable to other institutions. The finding that female students felt the database would encourage JABSOM students to conduct research more than male students may reflect a true gender difference but it could also reflect the small number of male respondents (n=3) who were not supportive of the database.

Conflict of Interest

None of the authors identify any conflict of interest.

Acknowledgements

The Office of Medical Education at the John A. Burns School of Medicine supported this project. Appreciation is extended to the survey-takers, the Research Interest Group members, and RIG's faculty advisor, Dr. Kenton Kramer, for making this project possible and helping to improve access to research at JABSOM. The authors also gratefully acknowledge Drs. Sheri Fong and Damon Sakai for their critical review and comments.

Authors' Affiliations:

- University of Hawai'i John A. Burns School of Medicine, Class of 2014, Honolulu, HI (TG, RA)
- University of Hawai'i John A. Burns School of Medicine, Office of Medical Education, Honolulu, HI (YSH, SH-W)
- University of California San Diego Medical Center, JABSOM Class of 2012, San Diego, CA (RH)

References

1. Jacobs C, Cross P. The value of medical student research: the experience at Stanford University School of Medicine. *Medical Education*. 1995;29(5):342-346.
2. Fisher W. Medical student research: a program of self-education. *Journal of Medical Education*. 1981;56(11):904-908.
3. Gonzales A, Westfall J, Barley G. Promoting medical student involvement in primary care research. *Family Medicine*. 1998;30(2):113-116.
4. Shrestha A, Shrestha A. The importance of doing research as a medical student. *Kathmandu University Medical Journal*. 2007;5(1):138.
5. Collier A. Medical school hotline: importance of research in medical education. *Hawaii J Med Public Health*. 2012;71(2):53-56.
6. Sanford T, Chancer Z, Kiyosaki K. Medical student research at the John A. Burns School of Medicine (JABSOM): the Research Interest Group. *Hawaii Med J*. 2010;69(7):172-179.
7. Kramer K. Medical student involvement in research in the preclinical years. *Hawaii Med J*. 2005;64(7):190-191.
8. Fong S, Sakai D. Medical student research at the John A Burns School of Medicine, University of Hawaii. *Hawaii Med J*. 2009;68(3):39.
9. Fong S, Sakai D. Should medical students be required to do research? A comparison of the quality and quantity of research productivity between required and elective research curricula. Annual meeting of the Association of American Medical Colleges (AAMC) Western Group on Educational Affairs (WGEA), March 31-April 3, 2012, Asilomar, CA.
10. Langhammer C, Garg K, Neubauer J, Rosenthal S, Kinzy T. Medical student research exposure via a series of modular research programs. *Journal of Investigative Medicine*. 2009;57(1):11-17.
11. Solomon S, Tom S, Pichert J, Wasserman D, Powers A. Impact of medical student research in the development of physician-scientists. *Journal of Investigative Medicine*. 2003;51(3):149-156.
12. Zier K, Friedman E, Smith L. Supportive programs increase medical students' research interest and productivity. *Journal of Investigative Medicine*. 2006;54(4):201-207.