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Quality Improvement

Utah Quality Advancement Laboratory Scholars: A Mentorship Program to Support Research and Dissemination in Clinical Track Hospitalist Faculty

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Abstract

Background

For academic hospitalists, research dissemination remains necessary for advancement and can help quality improvement (QI) and operational goals. Yet, few hospitalists receive research training, and research fellowships are often infeasible. Objective: Support research education in clinical track hospitalist faculty through a 9-month structured mentorship and didactic program.

Methods

We describe results of two scholar cohorts (n=8) between 2021-2023. To inform program design, we surveyed all hospitalist faculty on their research interests and barriers. Eight scholars completed pre- and post-program surveys assessing research confidence, program strengths/weaknesses, and academic progress.

Results

Of 58 hospitalists surveyed, 36 (62%) responded. Prior participation in QI (69%) and research (75%) was high though current involvement was lower (36% vs. 39%, respectively). Primary barriers to research were time, funding, and knowledge. Scholars reported more interest in conducting QI (88% [7/8]) than clinical research (25% [2/8]). Scholar projects were 50% QI, 12.5% operational, 12.5% outcomes, and 25% qualitative research; 62.5% (5/8) included residents. Post-program, scholars reported agreement/strong agreement that the program provided career development opportunities and taught them how to conduct quality research. In 4 of 6 domains, scholars reported higher research confidence ($p<0.01$). During 12-24 months post-program, scholar projects produced 8 abstracts, 2 awards, and a first-author manuscript; half (4/8) of scholars were promoted to associate professor (vs. 17% [8/47] of peer hospitalist assistant professors).

Conclusions

A research mentoring program for clinical track hospitalists is feasible and effective in improving research confidence and productivity. Additional benefits may include assisting trainees and colleagues through a mentorship pipeline.

BACKGROUND

Hospital medicine is expanding rapidly, with the number of hospitalists growing from several hundred in 1996 to over 50,000 in 2016. Despite the dramatic growth in the field, the number of hospitalist clinician investigators has increased much more slowly, and most hospitalists do not receive research training.[1,2]

For early-career academic hospitalists, lower research productivity can negatively impact their academic advancement and promotion. Hospitalists often participate in activities that could be disseminated (e.g., quality improvement [QI] projects, operational exercises, or educational initiatives) but lack the mentorship and skills to disseminate that work and receive appropriate credit. For example, a recent analysis of COVID-19-related articles published in the 4 top internal medicine journals demonstrated that hospitalists served as first, senior, or middle author in only 3-5% of publications.[3] Lack of dissemination also limits hospitalists' ability to receive funding for what often begins as volunteer work. Major barriers to research productivity in hospital medicine include not having protected time for research,[1] lack of funding,[4] and lack of mentorship.[1,4] A recent report indicated that only

2% of hospitalist faculty members conducted research for >50% of the time, and only 14% of hospital medicine groups had a research training program for hospitalist investigators.[4]

While most academic hospitalists do not desire to be grant-funded researchers[5] there is an important opportunity to build research capacity in hospital medicine so that academic hospitalists can be recognized for their diverse contributions to research. Inpatient clinical research would not be successful without the contributions of academic hospitalists who support research through their operational, QI, or educational leadership roles. Furthermore, dissemination of hospital medicine research is necessary so others can learn best practices for inpatient care.

In 2021, to support academic promotion and research growth of clinical track hospitalist faculty, we developed the Utah Quality Advancement Laboratory (UQuAL) Scholars program, a mentorship program focused on building research and dissemination skills. Here, we describe the UQuAL Scholars program and report its impact on research confidence and productivity for the first two scholar cohorts (n=8) between 2021-2023.

METHODS

Program development

As part of program development, in May 2021 we surveyed our institution's 58 hospital medicine clinicians (including physician hospitalists and advanced practice clinicians). The survey assessed experience with research/QI and sought to identify areas of interest and perceived barriers to research productivity (see supplement for survey).

Based on survey results, two hospitalists with varied experience in research developed the UQuAL Scholars program with a curriculum focused on guiding clinicians through the steps of refining a QI research question, planning for and conducting a research project, and disseminating the results (see **Table 1** for curriculum). The program was able to obtain limited funding for the UQuAL program leaders (5% full-time equivalent, FTE), a statistician/data analyst (20% FTE), and a project manager to support the scholars (estimated total cost ~$57,000 annually). UQuAL Scholars were provided no protected time for research.

UQuAL Scholars Selection

In July of 2021 and 2022, interested hospitalists were invited to submit a short application for UQuAL Scholars, including: a) identifying any relevant content mentor(s), b) a description of their interest in the program, c) prior QI/research experience, including dissemination products, and d) research interest/question to be answered during the scholars program. Applicants were asked to commit (via signature) to 80% didactic attendance, to submit an abstract within 1 year, and to submit a manuscript within 2 years. To be eligible for participation, scholars had to be clinical-track faculty with at least 1 year of clinical experience and be interested in QI or clinical research. The UQuAL Scholars program leaders met to select scholars, prioritizing those with either interests similar to the leaders' or an identified content mentor, and those with feasible research questions and project scope. Projects that aligned with existing institutional roles (e.g., QI or operational roles), which often came with additional resources, were preferentially selected based on the likelihood of completion. Four UQuAL Scholars were selected for each cohort.

UQuAL Scholars Program

Each UQuAL Scholar was assigned one of the two program leaders as a mentor. The didactic curriculum consisted of 14 sessions over 9 months (Sept-May; see **Table 1**). Each session was attended by 1-2 program leaders, had assigned pre-work (e.g., writing or reading assignment), and prioritized active participation (e.g., reviewing/revising writing assignments) during the session, with only very brief lectures. Writing assignments were specific to each scholar's individual project. At 6-months post-program, scholars were required to provide an update on their progress at a divisional works-in-progress meeting.

Program outcome assessments

We evaluated the UQuAL Scholars program in 4 ways: First, we administered a modified version of the Clinical Research Appraisal Inventory (CRAI-19)[11] via REDCap to evaluate pre- and post-program research confidence. The CRAI assesses 5 domains: study design/data analysis; collaboration/grant preparation; manuscript writing; responsible conduct of research; and dissemination of results, using a 10-point Likert scale (see the supplement for survey questions). To assess the scholar's ability to plan and manage research, we added 3 questions: creating a realistic project timeline, keeping themselves and collaborators accountable, and identifying and addressing barriers to project completion. Second, after program completion, we surveyed scholars' perceptions of program strengths, weaknesses, and usefulness, including a free-text section for open-ended comments. Third, we tracked scholars' academic productivity (e.g., abstracts and peer-reviewed publications) for up to 2 years following program participation. Finally, we compared the promotion rate from assistant to associate professor among scholars and non-scholar assistant professors.

Analysis

Characteristics and survey responses of all hospitalists and the UQuAL Scholars were summarized using de-

Table 1. Curriculum topics with pre-session tasks and in-session topics and activities.

Session[a]	Pre-Session Tasks	During Session
1. Introduction	• Meet with mentor • Brainstorm interests/topics • Set up meeting schedule • Complete pre-course survey	**Lecture** • Program overview • Syllabus, access to resources • Mentors' tips for research • Best practices/ important lessons • Establishing a timeline • Accountability suggestions
2. The Research Study	• Read: *Designing Clinical Research*[6] Ch 1 • Consider how different designs could address your research question • Cohort study • Cross-sectional study • Case-control study • Randomized controlled trial	**Activity** • Group activity – Design a randomized clinical trial for a clinical research question (goal—think through potential barriers and process of population and outcome selection) **Lecture** • Different study designs for a research question • Overview of STROBE guidelines
3. The Research Question	• Read: *Designing Clinical Research*[6] Ch 2 • Devise two potential research questions • PICOTS (patient, intervention, comparison, outcome, time, and setting) framework	**Lecture** • Review FINER (feasible, interesting, novel, ethical, and relevant) criteria for identifying an excellent research question **Activity** • Scholars present research question to group with (mentor/peer) feedback
4. Subjects and Sampling	• Read: *Designing Clinical Research*[6] Ch 3 • Choose Study Subjects • Consider "ideal" vs. "actual" inclusion/exclusion criteria	**Activity** • Scholars present their sampling process and receive group feedback **Lecture** • Overview of subject definition and sampling
5. Solidifying Your Project	• Create your study outline • Include: study design, refined research question (PICOTS format), inclusion/exclusion criteria, primary and secondary metrics and how to measure, hypothesis, potential barriers to success	**Activity** • Scholars present their study outlines **Lecture** • Introduction to Introductions
6. Introduction Drafts	• Write draft of Introduction in 3 paragraph format (general scope, specific problem or controversy, how your study will help)	**Lecture** • Writing tips – "How to Write Good" **Activity** • Mentees trade and review introductions • Does it make sense? • Is it compelling? • Can writing be improved?
7. Implementation Science[b]	• Read: Pronovost 2011[7] and Saint 2009[8] • Think about stakeholders surrounding your project—consider how to "sell" project'; Who is likely to be supportive? Resistant?; How will you address concerns, barriers, and obstacles?	**Lecture** • Approaches to engage stakeholders in quality improvement research **Activity** • Discussion of articles and individual projects
8. Getting Data for Your Project	• Brainstorm potential sources for data collection • Electronic and/or manual data collection • Scope – time period, depth of detail, inclusion/exclusion criteria • Privacy, confidentiality, data security • Format for analysis	**Lecture** • Getting data for your project **Activity** • Discussion of individual projects
9. Institutional Review Board (IRB) and Protocols	• Outline research protocol using one of the provided IRB templates • Register for access to IRB application platform • Complete Good Clinical Practice and Human Subjects Research CITI Training	**Lecture** • Overview of IRB **Activity** Discussion of individual projects

Session[a]	Pre-Session Tasks	During Session
10. Review of Methods	• Read: Vigliante 2019[9] • Find a manuscript in your target journal with a study design similar to yours • Draft Methods section using paper as a guide • Revise Introduction	**Activity** • Mentees trade and review Methods section • Highlight what is not clear • Questions/edits/suggestions
11. Intro/ Methods – Reviewing Drafts	• Revise Introduction and Methods sections	**Activity** • Trade and review Introductions and Methods **Lecture** • Tables and Figures
12. Tables and Figures	• Create skeleton tables and figures • Tables in Excel or Word • Figures sketched, described, or input with fake data • Reference manuscripts with similar study design for examples	**Activity** • Review Tables and Figures • Do they stand alone? • Is format correct? • Include definitions, abbreviations, footnotes? **Lecture** • Brief overview of Discussion • Paragraph 1; Summary of key point(s) • Paragraph 2; Main point in context of existing research. Why same or different? • Paragraph 3 (optional); Secondary points in context of existing research • Paragraph 4; Limitations and strengths • Paragraph 5 (optional); Policy implications • Paragraph 6; Summary (same as abstract summary)
13. Results and Discussion	• Revise Tables and Figures • Draft your Discussion	**Activity** • Trade and review Results and Discussion • Does it make sense? • Are sections parallel? • Can writing be improved?
14. Preparing for the Next 6 Months	• Reading: Shekarchian & Wray 2021[10] • Make a list of hard deadlines and the work backwards with steps to get there (sample included) • Email course directors with "grab bag" topic requests	**Activity** • Complete post-program survey • Identify one strategy to hold yourself accountable and share with group **Lecture** • "Grab bag" topics with mentors
6-Month Follow-up	• Create slides to summarize project progress • Start with research question – same or different? Why? • What stage is project in? Why? Issues or barriers? • Present preliminary data • Plans to submit the work? Meeting? Journal? • Updated timelines	• Mentees present project status to division (including next cohort of scholars)

[a]One-hour sessions were every 2-4 weeks over a 9-month period (Sept-May)
[b]Alternative topics, based on interest/experience of the cohort could be inserted, e.g., quasi-experimental design, statistical consultation.

scriptive statistics. To assess pre- vs. post-program differences in research confidence domains, we used paired t-tests with Bonferroni correction for multiple comparisons (p-values < 0.05 were considered significant). Free-text comments were reviewed for common themes. UQuAL Scholars' academic products were described, and rates of promotion to associate professor relative to all other hospital medicine assistant professors were compared using logistic regression, controlling for duration at the assistant professor rank. We followed EQUATOR reporting guidelines (STROBE checklist in **Appendix**). This project was reviewed by the University of Utah's Institutional Review Board and received an exempt determination.

RESULTS

Hospital medicine group pre-program survey

Demographics and academic/research experience

Pre-program survey response rates from the hospital medicine and UQuAL Scholars groups were 62% (36/58) and 100% (8/8), respectively. For the hospital medicine group, the majority of respondents had a rank of assistant professor (51%) and were White (91%), not Hispanic/Latino (94%), and female (51%). Most respondents had previously participated in a QI or research project (69% and 75%, respectively), and roughly half (54%) reported presenting a QI or research project at a national meeting and submitting to a peer-reviewed journal. 43% had published QI or research in a peer-reviewed journal. Current involvement in QI or research projects was lower (35% and 38%, respectively), with less than half reporting a leadership role in these projects. Demographics and academic/research experience of the scholars appeared similar to those of the larger hospital medicine group, with the exception of a higher proportion of females (75%) and current involvement in a QI project (63%). Just 2/8 (25%) of the scholars reported having previously led or assisted a research study. Characteristics of the hospital medicine and scholars' groups are in **Table 2**.

Academic and research interests and perceived barriers

When asked about academic interests, the majority of both the hospital medicine and scholars groups reported being "very" or "extremely" interested in education (67% and 63%, respectively), with lower levels of interest in research or administration (**Table 3**). A larger proportion of scholars (88%) were "very" or "extremely" interested in advancing clinical practice (including QI) than in the larger hospital medicine group (44%). The top reported barriers to conducting QI or clinical research were limited time, limited/no funding, limited knowledge, and statistical support. The barriers of a lack of good ideas and a lack of interest were rated as the least problematic (**Table 3**).

Program outcomes

Ten hospitalists applied to UQuAL scholars over the initial 2 years (7 in the first year [2 accepted in year 2; 5 in the second year). Of the 8 proposed projects, 4 (50%) were QI, 1 (12.5%) operational, 1 (12.5) % outcomes/data analysis, and 2 (25%) qualitative research.

Research confidence

Median post-program ratings of overall research confidence, across both scholar cohorts, were significantly higher than pre-program reported confidence ($p<0.01$, **Figure 1**). The domains of design/analysis, collaboration, writing manuscripts, and responsible research conduct all improved significantly ($p<0.01$).

Program evaluation

Program evaluation results are presented in **Table 4** and indicate agreement/strong agreement that the program was useful for career development, conducting and disseminating high-quality research, and developing organizational skills. The value of peer relationships with other scholars received the highest ratings (7/8 "strongly agree"). There was ambivalence (4/8 scholars neither agreeing or disagreeing) regarding the ability of the program to help with academic promotion.

When asked to identify the most helpful aspect of the program, scholars reported benefits that fell into 3 main categories:

1. Mentorship (e.g., "Having instruction and support from [mentors] was very helpful in conducting my own project, and I feel as though I could go to either of them with questions any time in the future.")
2. Having a timeline for task completion (e.g., "UQuAL made research more accessible for me. By breaking things down into bite-sized pieces, the idea of research as a whole is MUCH less stressful." and "I really liked having us do the assignments and keeping us accountable - PICOTS for our projects, introduction, methods, etc."), and
3. Working closely with peers (e.g., "I got to know my UQuAL peers better and think they will be a good resource moving forward." And [it was beneficial having] "other people learning the same thing at the same time.").

In response to the question "was there anything else you wished the program provided," two scholars responded with suggestions. The first requested information/discussion about setting a realistic timeline for a QI project while working in a full-time clinical position. The other scholar suggested it would have been helpful to have topics from the final lecture (reference software and time management) earlier in the program. This person also would have wanted more time between sessions to complete assignments.

All 8 UQuAL Scholars who completed the program disseminated their UQuAL projects at national meetings, and 2 scholars received awards. In the 24-month post-program period, one scholar successfully published their project as a first author. Reasons for scholars not publishing their project results included: results were not novel/publishable according to the scholar (n=1); barriers to project completion (lack of essential stakeholder buy-in, unable to recruit study participants (n=2); barriers to manuscript completion (incomplete analysis/interpreta-

Table 2. Hospital Medicine and UQuAL Scholars baseline characteristics

Demographics	Hospital Medicine Pre-program survey (n=36)*	UQuAL Scholars 2021-22 and 2022-23 cohorts (n=8)
Academic rank		
Instructor	1/35 (3%)	0
Assistant professor	18/35 (51%)	8/8 (100%)
Associate professor	4/35 (11%)	0
Professor	1/35 (3%)	0
Advanced practice clinician	11/35 (31%)	0
Race		
Caucasian	32/35 (91%)	8/8 (100%)
African American	0	0
Asian	3/35 (9%)	0
Unknown or not reported	0	0
Ethnicity		
Hispanic/Latinx	1/35 (3%)	0
Not Hispanic/Latinx	33/35 (94%)	7/8 (88%)
Unknown or not reported	1/35 (3%)	1/8 (13%)
Gender		
Male	17/35 (49%)	2/8 (25%)
Female	18/35 (51%)	6/8 (75%)
Academic and Research Experience	**'Yes" responses n/n (%)**	
Have you ever....		
Participated in a QI project?	25/36 (69%)	7/8 (88%)
Participated in a research project?	27/36 (75%)	8/8 (100%)
Clinical trials	5/36 (14%)	1/8 (13%)
Bench/laboratory	9/36 (25%)	3/8 (38%)
QI	19/36 (53%)	5/8 (63%)
Education	10/36 (28%)	2/8 (25%)
Other	5/36 (14%)	0
Received research funding?	6/36 (17%)	1/8 (13%)
Presented a QI or research project at a regional or national meeting?	20/36 (56%)	5/8 (63%)
Submitted a QI or research project to a peer-reviewed journal?	20/36 (56%)	5/8 (63%)
Published a QI or research project in a peer-reviewed journal?	16/36 (44%)	4/8 (50%)
Are you currently...		
Involved in a QI project?	13/36 (36%)	5/8 (63%)
Involved in a research study?	14/36 (39%)	2/8 (25%)
Role:		
Leading project (first author)	6/36 (17%)	1/8 (13%)
Directing/mentoring project (senior author)	5/36 (14%)	0
Assisting but not leading (middle author)	11/36 (31%)	1/8 (13%)

*not all respondents answered all questions

Abbreviations: UQuAL = Utah Quality Advancement Laboratory; QI = quality improvement

tion of data, lack of protected time/competing time demands (n=4). Subsequent to the program, four scholars applied for or were included on grant applications, and two became co-investigators on externally funded grants. The scholars program appeared to have additional unplanned benefits. We noted a "trickle down" effect as most scholars (63% [5/8]) included additional learners (resident physicians) in their projects, and a "halo" effect with 2 scholars publishing work closely related to their original projects.

At the time of reporting, 50% (4/8) of scholars had been promoted to associate professor compared with 17% (8/47) of assistant professors who had not participated in the program. After controlling for duration (years) in the assistant professor rank, promotion to associate professor remained significantly higher among scholars (odds ratio [OR]=5.061; 95% CI 1.03-24.83).

DISCUSSION

The UQuAL Scholars program—a mentorship program for clinical-track hospitalists—was associated with greater research confidence, successful dissemination, and higher academic promotion than non-scholar peers. The program was designed to address the need to improve research/QI knowledge and productivity among clinical-

Table 3. Assessment of academic and research interests and perceived barriers.

	Hospital Medicine Pre-program survey (n=36)		UQuAL Scholars 2021-22 and 2022-23 cohorts (n=8)	
Besides clinical care, what other academic interests do you have? 1= not interested; 2= slightly interested; 3= moderately interested; 4= very interested; 5= extremely interested				
	Mean (SD)	"very" or "extremely" interested n/n (%)	Mean (SD)	"very" or "extremely" interested n/n (%)
Education	3.9 (0.9)	24/36 (67%)	3.6 (1.2)	5/8 (63%)
Clinical practice advancement (incudes quality improvement)	3.3 (1.2)	16/36 (44%)	4.3 (0.7)	7/8 (88%)
Research	2.7 (1.0)	8/36 (22%)	2.9 (0.6)	1/8 (13%)
Administration	2.6 (1.3)	10/36 (28%)	3.0 (1.2)	2/8 (25%)
Please rate your level of interest for the following: 1= not interested; 2= slightly interested; 3= moderately interested; 4= very interested; 5= extremely interested				
	Mean (SD)	"very" or "extremely" interested n/n (%)	Mean (SD)	"very" or "extremely" interested n/n (%)
Conducting a QI project	3.2 (1.2)	13/36 (36%)	4.3 (0.7)	7/8 (88%)
Conducting a clinical research project	2.8 (1.2)	9/36 (25%)	3.0 (1.1)	2/8 (25%)
Conducting a medical education (research) project	3.3 (1.4)	17/35 (49%)	3.0 (1.1)	3/8 (38%)
Participating in a mentorship program to learn how to plan, conduct, and disseminate QI or clinical research	3.2 (1.3)	12/35 (34%)	n/a	n/a
What do you consider the biggest barriers to conducting QI or clinical research? 1= not a barrier; 2= slight barrier; 3= moderate barrier; 4= very much a barrier; 5= extreme barrier				
	Mean (SD)	"very" or "extreme" n/n (%)	Mean (SD)	"very" or "extreme" n/n (%)
Limited time	3.8 (0.9)	23/36 (64%)	4.1 (0.6)	7/8 (88%)
Limited/No funding	3.4 (1.1)	18/35 (51%)	3.4 (0.8)	4/8 (50%)
Limited knowledge	3.1 (0.8)	11/36 (31%)	3.4 (0.9)	3/8 (38%)
Statistical support	3.2 (1.2)	16/36 (44%)	3.9 (1.1)	5/8 (63%)
Database access	2.7 (1.0)	4/35 (11%)	3.1 (0.9)	3/8 (38%)
Project support	2.9 (1.1)	9/34 (26%)	3.3 (0.9)	4/8 (50%)
Lack of mentorship	2.7 (1.0)	5/36 (14%)	2.9 (1.0)	2/8 (25%)
No idea where to start	2.7 (1.2)	10/36 (28%)	2.4 (1.1)	2/8 (25%)
IRB navigation	2.4 (1.1)	6/35 (17%)	2.8 (1.3)	3/8 (38%)
Lack of good ideas	2.3 (1.0)	3/36 (8%)	2.1 (1.4)	1/8 (13%)
Lack of Interest	2.2 (1.1)	4/36 (11%)	1.4 (0.5)	0

Abbreviations: UQuAL = Utah Quality Advancement Laboratory; QI = quality improvement; SD = standard deviation; IRB = institutional review board

track hospitalists through mentored didactic and experiential learning. Our preprogram data indicated that while the majority of our hospital group had performed QI or research projects (69-75%), a smaller percentage had presented (54%) or published (43%) the work. Publication/dissemination of research/QI results was a major aim for the scholars program, and all eight scholars successfully disseminated their work at national meetings—though, to date, only one has published a first-author manuscript on their program project. For clinical faculty at our institution, presentations meet promotion criteria for "dissemination." Post-program, four scholars became involved in grant-funded work suggesting their research scholarship will continue. Exploring ways to sustain project momentum post-program is a priority, and we are piloting expansion of UQuAL Scholars to a 2-year program with the second year focused on finishing the proposed manuscript.

Unlike other research mentorship models, UQuAL Scholars was not designed to create or support tenure-track research faculty. The vast majority of academic hospitalists do not report research as their primary interest. Even so, research training offers multiple potential benefits for clinical-track faculty. First, understanding how to proactively and systematically examine a research or clinical question prior to beginning a QI, educational, or operational project can improve the project's impact on clinical practice. Second, for clinical track hospitalist faculty, dissemination—via poster, presentation, or publication—is critical for promotion to Associate Professor. Finally, demonstrable research knowledge and experience may make clinical track faculty better situated to become

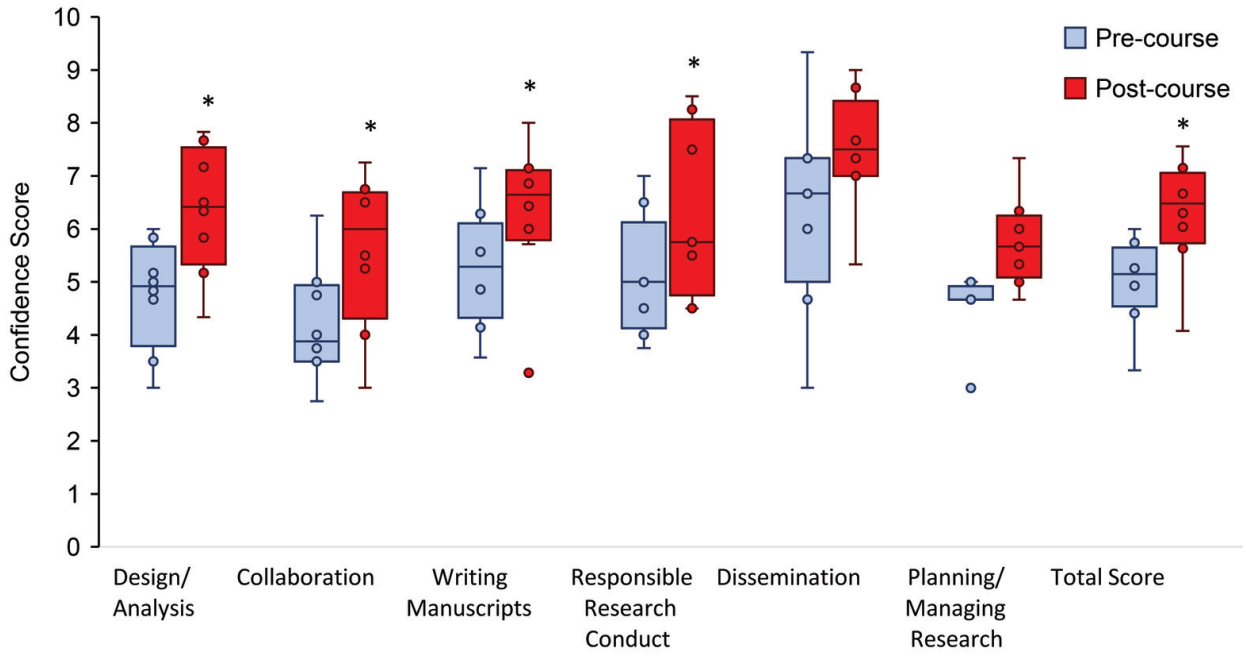

Figure 1. Median (IQR) pre- and post-program participant ratings of research confidence domains across two cohorts (n=8).

*Paired t-test, Bonferroni corrected significant P-value <0.008

Bars reflect median (IQR) scores from both 2021-22 and 2022-23 cohorts, with blue bars representing scores prior to the UQuAL Scholars program and red bars reflecting scores after.

Table 4. UQuAL Scholars post-program evaluation

	Strongly Disagree (1)	Disagree (2)	Neither Agree nor Disagree (3)	Agree (4)	Strongly Agree (5)	Mean (SD)
The UQuAL Scholars program provided me with the opportunity to develop my career	0	0	0	4/8	4/8	4.5 (0.53)
The UQuAL Scholars program taught me how to conduct high quality research	0	0	0	4/8	4/8	4.5 (0.53)
The UQuAL Scholars program taught me how to write a manuscript	0	0	0	3/8	5/8	4.6 (0.52)
I feel confident in my ability to complete a scholarly project	0	0	1/8	6/8	1/8	4.0 (0.53)
The UQuAL Scholars program helped me with academic promotion	0	0	4/8	1/8	3/8	3.9 (0.99)
The UQuAL Scholars program helped my develop organizational skills	0	0	0	4/8	4/8	4.5 (0.53)
The peer relationships with other UQuAL Scholars has been valuable	0	0	0	1/8	7/8	4.9 (0.35)

Abbreviations: UQuAL = Utah Quality Advancement Laboratory; QI = quality improvement; SD = standard deviation

co-investigators, site principal investigators, or program leaders, which may offer protected time. For example, a unit leader who knows how to review the literature and ask and answer a scientifically answerable question is better poised to implement successful quality improvement interventions.

Post-program evaluations indicated that peer relationships developed during the program were highly valued and could serve as a resource for continued collaboration. Facilitating a peer-mentoring structure after the program could help sustain focus and momentum; however, maintaining a peer-mentoring network requires time and effort. In turn, experience with UQuAL Scholars could evolve into mentorship of more junior colleagues and other learners, thereby increasing the organization's overall mentorship capacity. Given that hospital medicine has a small number of senior faculty, this capacity building is critical to supporting the continued academic success of the hospitalist program. Though not directly explored, the fact that most UQuAL Scholar projects included residents could positively impact our program's ability to recruit talented academic hospitalists.

The post-program survey indicated some ambivalence (4/8 scholars neither agreeing or disagreeing) regarding the value of the program to help with academic promotion. This may be due to the short duration of the scholars program (9 months) relative to the time course of promotion (years). It is also true that academic hospitalists

have multiple paths to promotion; promotion for clinical faculty is possible without strong research scholarship.

LIMITATIONS AND STRENGTHS

First, the small number of program participants and lack of a true comparison group limit our ability to broadly assess the impact of UQuAL Scholars. The scholars were motivated to participate in this program, which could mean they were more aggressively working toward promotion and research dissemination compared to others. It is likely that the scholars who were promoted were well on their way before they began the program. This self-selection of highly motivated scholars may be viewed as a strength because other clinical-track hospitalist faculty may pursue alternative paths to advancement (e.g., education) that better align with their interests. We suspect that targeting the scholars program to those most interested increases the likelihood of success and impact. Second, while the UQuAL Scholars program appeared to enhance research capabilities and address important barriers, there are other barriers, such as lack of funding and protected time that hinder productivity and may require institutional support to overcome. In both cohorts, mentees were highly motivated to attend sessions; however, enlisting additional institutional support for time to attend sessions and perform research/QI-related tasks may enhance engagement. We acknowledge that financial support is challenging to obtain. Finally, UQuAL Scholars was enabled by the leadership of two hospital medicine researchers. One of the program leaders is a tenure-track hospital medicine researcher, while the other is a clinical-track faculty member with experience conducting high-quality hospital medicine research. Not all hospital medicine programs have access to such leadership or the resources needed to protect their time for mentorship.

Despite these limitations, we demonstrated that a hospitalist mentorship program for clinical track faculty is feasible, requires minimal resources, and improves junior clinical track faculty knowledge and productivity while contributing to the academic culture of a hospital medicine group. Specifically, this program increased research engagement and grant funding among clinical-track hospitalist faculty with limited research experience at the program's outset. In conclusion, we found that a research mentoring program for clinical-track hospitalists is feasible, improves knowledge and research productivity, and may contribute to the promotion of junior faculty, while advancing the academic culture of a hospital medicine group.

Disclosures/Conflicts of Interest

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SUPPLEMENTARY MATERIALS

Appendix

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