

Impact of Financial Incentives and Department Size on Scholarly Activity Output

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ABSTRACT

PURPOSE Family medicine research is essential to improving population health. It has the unique ability to answer questions about health care outcomes and use those insights to impact communities. Increasing research capacity continues to be a challenge; however, recent literature has touted the success of incentivization in several academic medicine specialties. We used the 2022 CERA annual Family Medicine Department Chair survey to characterize the amount and type of scholarly activities by institutional financial incentive status (yes or no) and type (flat vs variable amount), to investigate the relationship between financial incentives and scholarly output.

METHODS Questions included targeted demographic variables, institutional incentives, and family medicine department scholarly output. Summary statistics and logistical regression analyses were conducted.

RESULTS The overall survey response rate was 47.1% (106/225). Respondents reported financial incentives were allowed at 41 (38.7%) of 106 institutions. Of these, 19 (17.9%) reported clinical faculty received cash-based incentives, while 34 (32.1%) received non-cash-based incentives for engaging in scholarly activity. The main barriers to offering financial incentives were institutional budget constraints and department culture or tradition. Financial incentives were not statistically associated with scholarly output; however, faculty size was statistically significant for giving more than 6 presentations (adjusted odds ratio = 0.20; 95% CI, 0.054-0.739).

CONCLUSIONS Institutions aiming to increase their family medicine department scholarly productivity might benefit from focusing resources on increasing their faculty size such as adding consultants, statistical analysts, grant writers, or other research staff.

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INTRODUCTION

Health care research provides high value to society through its ability to provide insights into care patterns and health care costs, treatment outcomes, and disease trends and risk factors.¹ Within family medicine (the backbone of the health care infrastructure)²⁻⁴ the use of research methods to address key questions about health care outcomes and system performance, while also considering the needs of the communities served, is a fundamental aspect of the specialty and vital for enhancing population health.⁵

Increasing research capacity within family medicine is a well-documented struggle.⁶⁻¹¹ Family medicine research suffers from a lack of published reports,⁶ author diversity,^{12,13} and grant funding.^{14,15} Furthermore, the inability to expand the family medicine research enterprise plays a role in the inability to recruit students into the specialty.¹⁶ Barriers often cited by researchers include lack of adequate research training,¹⁷ competing clinical demands,^{18,19} leadership culture and mentorship,^{18,20} lack of motivation,^{19,21} and lack of funding and supportive infrastructure.^{19,22,23}

Elements of productive research departments^{9,10,23} and potential systematic changes for increasing family medicine research productivity^{18,24,25} are well documented. Several reports have indicated that development of interdisciplinary research teams, protecting faculty time for scholarly activity, and increasing ease of access to experts in statistics or grant preparation are needed.^{6,9,26}

One of the more novel ideas is the use of incentives to boost scholarly activity among academic faculty. One researcher, investigating the effectiveness of increased incentives within clinical surgical faculty found incentives resulted in a

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case report volume increase of 4.3% and growth in overall department research.²⁷ The Department of Family Medicine at the State University of New York at University of Buffalo utilized incentive theory to implement an incentive plan which, after 2 years, resulted in a 9% increase in scholarly activity measured by grants received, peer-reviewed papers, and presentations.²⁸ A weighted lottery system effectively incentivized scholarly activity among pediatric residents and boosted engagement by 53%, as measured by abstract submissions, posters accepted, and manuscript activities.²⁹ Though the previous examples illustrate successful incentivization of scholarly activity, they fail to clarify whether the incentives were tied to a larger cultural shift or departmental mandates, potentially leading to a confounding effect.

As the literature demonstrates, there remains a lack of insight into the current state of institutional incentivization among current family medicine faculty. The purposes of this study were to: (1) characterize the amount and type of scholarly activities by institutional financial incentive status (yes or no) and type (flat vs variable amount); (2) investigate the precedence of scholarly output; and (3) explore factors associated with scholarly output with a focus on financial incentives. We hypothesize financial incentive status will be positively associated with scholarly output.

METHODS

Survey Development and Sample

The Council of Academic Family Medicine (CAFM) is a leadership and research collaborative between the Association of Departments of Family Medicine, the Association of Family Medicine Residency Directors, the North American Primary Care Research Group, and the Society of Teachers of Family Medicine. The CAFM Educational Research Alliance (CERA) annually surveys Family Medicine Department Chairs. The CERA survey methodology has been previously published in detail.³⁰ Questions for each topic module were evaluated for consistency with the subproject aim, readability, and existing evidence of reliability and validity by the CERA Steering Committee. Family medicine educators who were not part of the target population pretested the survey for flow, timing, and readability, then the questions were modified based on feedback received. The American Academy of Family Physicians Institutional Review Board gave ethical approval for this study in August 2022. Data was collected from August 16 through September 16, 2022, and data analysis was conducted from October 2022 through July 2023.

The survey sampling frame was family medicine department chairs as identified by the Association of Departments of Family Medicine. Eligible survey participants were e-mailed a link to the online Survey Monkey (Symphony Technology Group) survey. Five follow-up e-mails were sent to nonrespondents to encourage participation: 4 weekly e-mails after the initial e-mail invitation and a final reminder the morning the survey closed. Of the 219 US department chairs and

18 Canadian department chairs identified for surveying, 6 US e-mails were undeliverable and 5 people in the United States and 1 person in Canada indicated they were no longer a department chair. Thus, the survey was delivered to 225 department chairs (208 US chairs and 17 Canadian chairs).

Measures

Demographic data were obtained from the 15 recurring questions of the survey ([Supplemental Tables 1 and 2](#)). For our analysis, we combined the type of residency program associated with the department into (1) medical school based, affiliated, or administered, and (2) non-medical school based, affiliated, or administered, as we anticipate the medical school affiliation to have the greatest impact on scholarly activity and incentives for scholarly activities. To facilitate multivariate analysis for the 11 questions on scholarly activity and financial incentives we dichotomized the quantity variables into an indicator for 6 or more in each category ([Supplemental Tables 3 and 4](#)).

Statistical Analysis

Descriptive statistics were created for all variables. The total number of responses and percentages are reported for categorical variables, and mean and standard deviation are reported for continuous variables. Bivariate analysis was performed between the module questions and the demographic variables to determine statistically significant results and those which had high effect associations. Multivariate logistic regressions were used to examine adjusted impacts for significant associations. All data analysis was performed using StataSE 14 (StataCorp LLC) and a *P* value of .05 was used to determine statistical significance.

RESULTS

Of the 121 total responses to the survey, 106 completed both the demography and scholarly productivity module questions, and 15 answered only the demographic questions (overall response rate of 47.1%, 106/225). As with previous CERA surveys, the department chair respondents were similar to the entire cohort. The responding sample reported a mean of 5.44 years in their current position, a mean of 6.62 years of total department chair tenure, a minority (13.2%) identified as underrepresented in medicine, female 36.8%, White 78.3%, and the majority (78.3%) of programs were medical school-based/medical school-affiliated, 90.6% had a family medicine clerkship, and 56.6% reported 25 or more full-time equivalent faculty ([Supplemental Tables 1 and 2](#)).

Univariate Analysis

Results of our univariate analysis are presented in [Table 1](#).

Overall, of the 106 responding department chairs, 17 (16.0%) reported that they personally did not produce any scholarly products in 2021-2022; 5 (4.7%) departments presented no posters, 10 (9.4%) had no PubMed-indexed research

articles, 27 (25.5%) had no editorial or commentary articles, 37 (34.9%) had no clinical review articles published, and 19 (17.9%) indicated no other scholarly activity. In comparison, department chairs reported scholarly activity of 6 or more of the following: 53 (50.0%) posters/oral abstracts, 42 (39.6%) peer-reviewed original research articles, 14 (13.2%) editorials or commentary articles, 22 (20.8%) clinical review articles and 43 (40.6%) other scholarly activity.

Regarding incentivization, 41 (38.7%) of responding department chairs indicated financial incentives were allowed at their institution. However, 19 (17.9%) indicated that their clinical faculty receive cash-based incentives, while 34 (32.1%) indicated that their faculty received nonfinancial incentives for engaging in scholarly activity. Department chairs indicated that the primary barrier to offering financial incentives was institutional budget constraints 38 (35.8%). The second most selected barrier was department culture or tradition 11 (10.4%). Additionally, the main limitations to engaging in scholarly activity were high patient care demands 47 (44.3%), lack of resources 17 (16.0%), and low research effort support 13 (12.3%).

Bivariate and Multivariate Analysis

When fully adjusting for financial incentives, department full-time equivalent (FTE), and other demographic variables (type of residency program, program location, community size, department chair current tenure, department chair sex, department chair underrepresented in medicine status, department chair race, and department chair age), financial incentives were shown to have no significant effect on scholarly output where departments were producing 6 or more products in the categories of clinical review articles, editorials, research articles, and posters (Table 2 and Supplemental Table 5). In comparison, departments with less than 25 FTE faculty were less likely to produce 6 or more presentations.

DISCUSSION

The finding that less than one-half of department chairs reported offering incentives for scholarly activity at their institutions was striking. This lack is not unique to family medicine³¹ and may shed light on greater concerns surrounding financial challenges faced by academic medicine as a

Table 1. Faculty Scholarly Activity vs Institutional Financial Incentives

	Total (N = 106)		No financial incentive (n = 65)		Financial incentive (n = 41)	
Scholarly productivity questions	No.	%	No.	%	No.	%
In the 2021-2022 academic year, how many of the following scholarly activities did your clinic-based FM faculty complete:						
Poster or oral abstract presentation at an academic conference (local, regional, or national), No.						
0	5	4.7	5	7.7	0	0.0
1-5	47	44.3	29	44.6	18	43.9
≥6	53	50.0	30	46.2	23	56.1
Missing	1	0.9	1	1.5	0	0.0
PubMed-indexed peer-review original research article published, No.						
0	10	9.4	7	10.8	3	7.3
1 to 5	54	50.9	35	53.8	19	46.3
≥6	42	39.6	23	35.4	19	46.3
Missing	0	0.0	0	0.0	0	0.0
Editorial or commentary article published, No.						
0	27	25.5	20	30.8	7	17.1
1-5	60	56.6	34	52.3	26	63.4
≥6	14	13.2	8	12.3	6	14.6
Missing	5	4.7	3	4.6	2	4.9
Clinical review articles published, No.						
0	37	34.9	26	40.0	11	26.8
1-5	44	41.5	25	38.5	19	46.3
≥6	22	20.8	11	16.9	11	26.8
Missing	3	2.8	3	4.6	0	0.0
Other scholarly activity, No.						
0	19	17.9	16	24.6	3	7.3
1-5	24	22.6	13	20.0	11	26.8
≥6	43	40.6	23	35.4	20	48.8
Missing	20	18.9	13	20.0	7	17.1
Did you yourself produce a scholarly product in academic year 2021-2022? (Select all that apply)						
None	17	16.0	10	15.4	7	17.1
Poster or oral abstract presentation at an academic conference (local, regional, or national)	51	48.1	31	47.7	20	48.8
PubMed-indexed peer-review original research article published	58	54.7	32	49.2	26	63.4
Editorial or commentary article published	34	32.1	20	30.8	14	34.1
Clinical review articles published	16	15.1	5	7.7	11	26.8
Other (please specify)	21	19.8	11	16.9	10	2.4

continues

FM = family medicine.

Note: Source: Analysis of the Fall 2022 Council of Academic Family Medicine Educational Research Alliance Family Medicine Residency Directors Survey.

Table 1. Faculty Scholarly Activity vs Institutional Financial Incentives, *continued*

Scholarly productivity questions	Total (N = 106)		No financial incentive (n = 65)		Financial incentive (n = 41)	
	No.	%	No.	%	No.	%
What is the greatest barrier to your institution offering financial incentive for scholarly activities?						
Institutional governance rules directly disallow	...	...	9	13.8	...	...
Institutional budget constraints	...	...	38	58.5	...	...
Department culture or tradition	...	...	11	16.9	...	...
Other	...	...	5	7.7	...	...
Missing	...	...	2	3.1	...	...
In the 2021-2022 academic year, did your clinic-based FM faculty receive a cash-based incentive for engaging in scholarly activities (excluding professional meeting attendance expenses)?						
No	...	...	...	...	22	53.7
Yes, a salary bonus, a set amount if any activity	...	...	...	...	1	2.4
Yes, a salary bonus, a variable amount based on activity	...	...	...	...	18	43.9
Missing	...	...	...	...	0	0.0
In the 2021-2022 academic year, did your clinic-based FM faculty receive nonfinancial incentives for engaging in scholarly activities?						
No	70	66.0	47	72.3	23	56.1
Yes	34	32.1	17	26.2	17	41.5
Missing	2	1.9	1	1.5	1	2.4
What is the greatest limitation your FM clinical faculty face in engaging in scholarly activities?						
None	3	2.8	3	4.6	0	0.0
Research effort support not available	13	12.3	11	16.9	2	4.9
High patient care demands	47	44.3	27	41.5	20	48.8
Lack of resources (research expertise, mentoring, etc)	17	16.0	11	16.9	6	14.6
Lack of interest in scholarship	15	14.2	6	9.2	9	22.0
Other	8	7.5	5	7.7	3	7.3
Missing	3	2.8	2	3.1	1	2.4

FM = family medicine.

Note: Source: Analysis of the Fall 2022 Council of Academic Family Medicine Educational Research Alliance Family Medicine Residency Directors Survey.

system on the scholarly activity of academic ophthalmology attendings showed the incentives heavily influenced increases in faculty mentorship activity rather than research productivity. They surmised that this was due to other academic activity such as mentorship allowing for schedule flexibility guaranteeing a path to accruing points within the system.³⁸

In our study, results showed poster presentations were created twice as much as clinical research articles (16% vs 8%). Success of poster presentations as a knowledge transfer medium relies on characteristics such as design, color, and information framing which can push the scientific message to the background.³⁹⁻⁴¹ This focus on first impressions rather than scientific merit and information may be a major selling point for overburdened faculty in terms of scholarly activity preference. Due to overwhelming time commitments, faculty may prefer mediums that have lower barriers for entry or less strain of mental engagement. This concept is supported by research about the implementation of an academic performance-based incentive system on resident research productivity in which the authors found an increase in institutional review board (IRB)-approved case reports and retrospective clinical studies over other types of scholarly activity.⁴²

The department chair's reports of high patient care demands and

whole. The majority of resources in academic medicine are allocated to the providing health care services to patients which results in little remaining funding for medical training and research.³² At the department level, this priority for clinical service, residency training, and education continues, leaving little support for the idea of financial incentivization for scholarship.

Our finding of 41 (38.7%) departments offering financial incentives is in line with literature showing institutions being more accepting of incentive utilization within health care and academic medicine to drive productivity.^{27-29,33-36} Incentives can result in unintended consequences, however, creating situations requiring individuals to prioritize their activities.^{36,37} For instance, a study on the effects of a monetized points

lack of funding support as barriers to their department's involvement in scholarly activity is supported by literature showing decreases in external funding support for family medicine researchers^{10,14,15,43,44} and increases in primary care visit duration and patient complexity.^{45,46} These trends have left academic family medicine clinicians with little time and energy for scholarly exploration, and unless this is addressed it may impede the progress of any scholarly output initiatives. Some institutions, however, have successfully integrated patient care with research through innovative models like patient-centered research networks or collaborative care research initiatives, demonstrating that it is possible to harmonize the 2 missions of providing both high-quality patient care and advancing scholarly research.^{47,48}

Due to the trends of patient care and department financial flexibility, increasing scholarly activity within family medicine departments may involve some indirect actions such as optimizing department size and increasing racial diversity. Initial statistical analysis revealed an imbalance in diversity across department chairs. While the communities served by the family medicine enterprise may be diverse, it does not translate to the leadership arena.^{49,50} Diversity has been shown to have a positive effect on scholarly productivity, impact, and quality,⁵¹⁻⁵⁴ and future research should continue to investigate this relationship. Furthermore, the relationship between clinical productivity and scholarly output regarding incentive programs requires careful consideration and further exploration, as poorly chosen metrics may lead participants to prioritize undesirable activities (eg, publishing in predatory journals).

Within family medicine¹⁰ and across academic medicine, the literature consistently supports our finding of a negative association between department faculty size and scholarly productivity.⁵⁵⁻⁵⁷ The literature on the optimal size of a department is limited; therefore, departments aiming to increase scholarly activity should be encouraged to focus on intentional, small changes within a robust evaluation framework. Changes departments could pursue include adding mechanisms to pay for consultants to conduct statistical analysis, help with grant writing, or adding a PhD researcher.^{8,9,58}

Our study's focus on department chairs, excluding faculty input on barriers and other qualitative measures, was a major limitation. Previous literature has shown differences in perceptions across department levels and this lack of diverse role inputs may have biased our findings. Additionally, our

response rate of less than 50% may result in a biased representation of scholarly incentives; especially if those who offer an incentive are more likely to reply. The responding sample, however, demonstrated a similar distribution across characteristics as the full sample invited to participate. Additionally, we did not differentiate between various sizes of financial incentives. As we performed multiple comparisons, our statistically significant results should be taken as a signal of important associations. If we were to apply a multiple comparison correction, such as the Bonferroni correction (multiplying the *P* value by the number of comparison tests run on the data), most of our statistically significant results would become nonsignificant.⁵⁹

Confounding factors arise when financial incentives are considered alongside the myriad other motivations and potential deterrents for participating in research and scholarship. Leaders must establish compelling reasons for faculty to engage in scholarly work, and recognize that motivations can differ among individuals and fluctuate over time. Motivations may range from personal fulfillment and societal impact to academic prestige and opportunities for promotion. Future research should consider adopting a mixed methods approach. By integrating survey data with follow-up interviews, we can achieve a more comprehensive understanding of the issues surrounding incentivization.

Increasing scholarly production within family medicine departments is a complex and multifactorial issue. In our sample, a minority of family medicine departments offered financial incentives for scholarly activity. Offering such benefits was not statistically associated with scholarly productivity. Determining the size and optimal incentivization scheme to strengthen the family medicine research enterprise increases the specialty's ability to generate new insights in primary care; thus creating a more effective health care system that can improve patient care and population health.

Table 2. Multivariable Logistic Regression Results

Dependent variable	Fully adjusted OR (95% CI) ^a
Clinical review articles, ≥6	
Financial incentives	1.084 (0.184-6.379)
Full-time equivalents, < 25 ^b	0.149 (0.018-1.237)
Editorials, ≥6	
Financial incentives	0.122 (0.002-6.260)
Full-time equivalents, < 25 ^b	0.0501(0.002-1.605)
Research articles, ≥6	
Financial incentives	0.995 (0.253-3.920)
Full-time equivalents, < 25 ^b	0.982 (0.279-3.462)
Poster presentations, ≥6	
Financial incentives	1.164 (0.314-4.320)
Full-time equivalents, < 25 ^b	0.199 (0.054-0.739) ^c

OR = odds ratio.

Note: Source: Analysis of the Fall 2022 Council of Academic Family Medicine Educational Research Alliance Family Medicine Residency Directors Survey.

^a Adjusted for type of residency program, program location, community size, department chair current tenure, department chair sex, department chair underrepresented in medicine status, department chair race, and department chair age.

^b Less than 25 full-time person equivalents in the practice.

^c Significant at a *P* value of .05

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 [Supplemental materials](#)

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