

Impact of a Resident-Driven Research Club on Scholarly Activity in an Academic Internal Medicine Residency Program During the COVID-19 Pandemic

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ABSTRACT

OBJECTIVES: Traditional journal clubs have been shown to be insufficient in improving residents' scholarly productivity, often due to the inability to sustain residents' interest and participation. Additionally, the 2019 novel coronavirus (COVID-19) pandemic restrictions caused a decline in academic scholarly productivity across residency programs. We evaluated the impact of a resident-led research club called 'journal café' on residents' scholarly productivity by comparing scholarly output between the journal café members and non-members during the COVID-19 pandemic.

METHODS: The journal café was established in the 2012/2013 academic year by internal medicine residents of a university residency program in Atlanta, Georgia, to foster self-directed collaboration among residents based on shared interests in academic research. The journal café runs independently of the residency program's journal club. We categorized IM residents at our institution into journal café members and non-members and collected data on their research productivity during residency training and the COVID-19 pandemic. The survey was conducted between April and June 2021 and analyzed data presented using frequencies, tables, and appropriate charts.

RESULTS: Sixty-eight residents (29 journal café members and 39 non-members) completed the survey (response rate of 85%). A significantly higher number of journal café members reported having five or more research publications (55.1% vs 7.1%, $P < .001$) and scientific presentations (48.3% vs 2.6%, $P < .001$) compared with non-members. Additionally, more journal café members published COVID-19-related research in peer-reviewed journals compared with non-members (68% vs 32%, $n = 19$). Finally, most of the residents cited the opportunity of a platform to share and brainstorm on research ideas as the reason for joining the journal café.

CONCLUSION: We found an association between journal café participation and increased scholarly activity, particularly during the COVID-19 pandemic. Independent resident-led research clubs supported by the residency program may complement the traditional journal clubs and enhance residents' participation in research.

KEYWORDS: Journal café, journal club, internal medicine, residency, research, scholarly activity

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Introduction

Journal clubs are an integral component of internal medicine residency training and education.¹ The overarching objective of journal clubs is to enhance scholarly productivity among residents, teaching them how to critically appraise research in the literature and consistently keep abreast of new evidence in clinical practice.^{1–3} Additionally, the Accreditation Council for Graduate Medical Education (ACGME) recommends research participation during residency and requires internal medicine residents to complete a scholarly research activity before graduation to promote the practice of evidence-based medicine.^{4,5}

However, studies show that the journal clubs have not effectively and consistently increased scholarly output among residents, often

due to a lack of specific goals and an inability to sustain residents' interest and participation.^{6–8} Unfortunately, the COVID-19 pandemic restrictions and social distancing mandates disrupted the traditional flow of residency training activities, including research, resulting in more decline in academic scholarly productivity.^{9–11}

Multiple residency programs have developed different supplementary strategies to improve scholarly research productivity during residency training.^{12–14} At our institution, we set up a resident-led research initiative called journal café during the 2013/2014 academic year to increase residents' participation in research and foster a culture of evidence-based clinical practice. Membership and participation in the journal café are voluntary. We evaluated the impact of the journal café on research



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Table 1. Leadership of the journal café and responsibilities.

JOURNAL CAFÉ LEADERSHIP POSITION	RESPONSIBILITIES	RESPONSIBILITIES
President	<ul style="list-style-type: none"> Prepare the schedule of the journal café for the academic year and share with members. Prepare the agenda and moderate the activities of the journal café during monthly meetings 	<ul style="list-style-type: none"> Work with members to select topics and peer-reviewed papers for discussion and critique. Liaise with the faculty advisor to engage guest speakers and experts.
Vice President	<ul style="list-style-type: none"> Work closely with the president to prepare schedule for the academic year. Moderate meetings in the absence of the president 	<ul style="list-style-type: none"> Keep a database of upcoming scientific conferences, publications, and scientific conference presentations by Journal café members.
Meeting Coordinator	<ul style="list-style-type: none"> Send out notice of meetings and the agenda. Take records of meeting attendance, minutes and disseminate after the meeting. 	<ul style="list-style-type: none"> Coordinate refreshment for members during meetings Prepares the budget for the year and keep financial records.
Faculty Advisor	<ul style="list-style-type: none"> Reviews the journal café schedule of activities for the year and makes recommendations. Serves as the liaison with residency program leadership to solicit for financial support. 	<ul style="list-style-type: none"> Suggests guest speakers and subject matter experts to make presentations on selected research topics. Participate in journal café and research working group meetings and facilitate engagements among members.

- The café leadership is nominated and elected by the journal café members through a ballot system. The leaders are typically PGY-2 or 3 residents and must have been members of the journal café for at least one year.
- Presentations on research topics/projects are assigned to journal café members at the start of the academic year.
- Journal café members are IM resident physicians from PGY1-3. Though some of the residents have advanced research training, this is not a pre-requisite to be assigned or present a research topic.
- The faculty advisor is an associate professor of internal medicine with a Ph.D. degree in Anatomy and clinical research. The faculty advisor attends the research meetings.
- At the time of the survey, there were six research working groups within the journal café (cardiology, COVID-19 pandemic, gastroenterology, general internal medicine, hematology/oncology, pulmonary/critical care, and rheumatology). Each group has an average of four members. Some residents belong to more than one research group.
- New research working groups are continuously formed based on members' interests in the different IM subspecialties.

productivity among the internal medicine residents in our institution, particularly during the COVID-19 pandemic.

Methods

Composition and description of the journal café activities

This is a descriptive study utilizing a cross-sectional design to evaluate the impact of the journal café on internal medicine residents' scholarly productivity. The journal café was established in the 2012/2013 academic year by internal medicine residents of an academic internal medicine residency program in Atlanta, Georgia, to provide an avenue for residents interested in academic research to collaborate. The residency program leadership encourages the residents to join and participate in the activities of the journal café. The leadership includes the president, vice president, meeting coordinator, and faculty advisor; their responsibilities are listed in Table 1. The journal café at the time of this study had 29 members, corresponding to approximately one-third of the total number of internal medicine residents in the program. Members of the journal café form different working groups based on shared research interests and meet on the last Friday of each month for 1 hour to discuss proposed research projects, critique scientific papers published in peer-reviewed journals, and learn about research designs, epidemiology, and statistical analysis. The meetings are in-person within the training hospital. However, during the COVID-19 pandemic, the members met virtually to reduce the spread of COVID-19 infection. The typical schedule of journal café activities is described in

Figure 1. The journal café is financially supported by the residency program with an estimated monthly budget of \$ 500 for refreshments during meetings, data collection, and statistical support.

The journal café runs independently of the mandatory residency program journal club meeting, usually held monthly on a Wednesday selected by the residency program leadership. For the traditional journal club presentation, the residency program leadership arbitrarily chooses a peer-review article, usually a recently published randomized clinical trial. The selected article is summarized and presented by a resident (typically a postgraduate year [PGY] 2 or PGY 3) who moderates the critique and discussion for about 45 minutes. Subsequently, a faculty member briefly provides teaching on a topic in epidemiology or statistics for about 15–20 min.

Data collection

We surveyed the internal medicine residents at our institution during the COVID-19 pandemic to compare research productivity between journal café members and non-members. The Morehouse School of Medicine (MSM) Institutional Review Board (IRB), IRB no: 1743191, approved the study and data collection tools on April 5, 2021. The survey was distributed electronically via email to the residents, and responses were collected between May 1, 2021, and June 30, 2021. The survey was voluntary, and written informed consents were signed by the participants before completing the surveys. The survey instrument was developed based on previously published research on scholarly

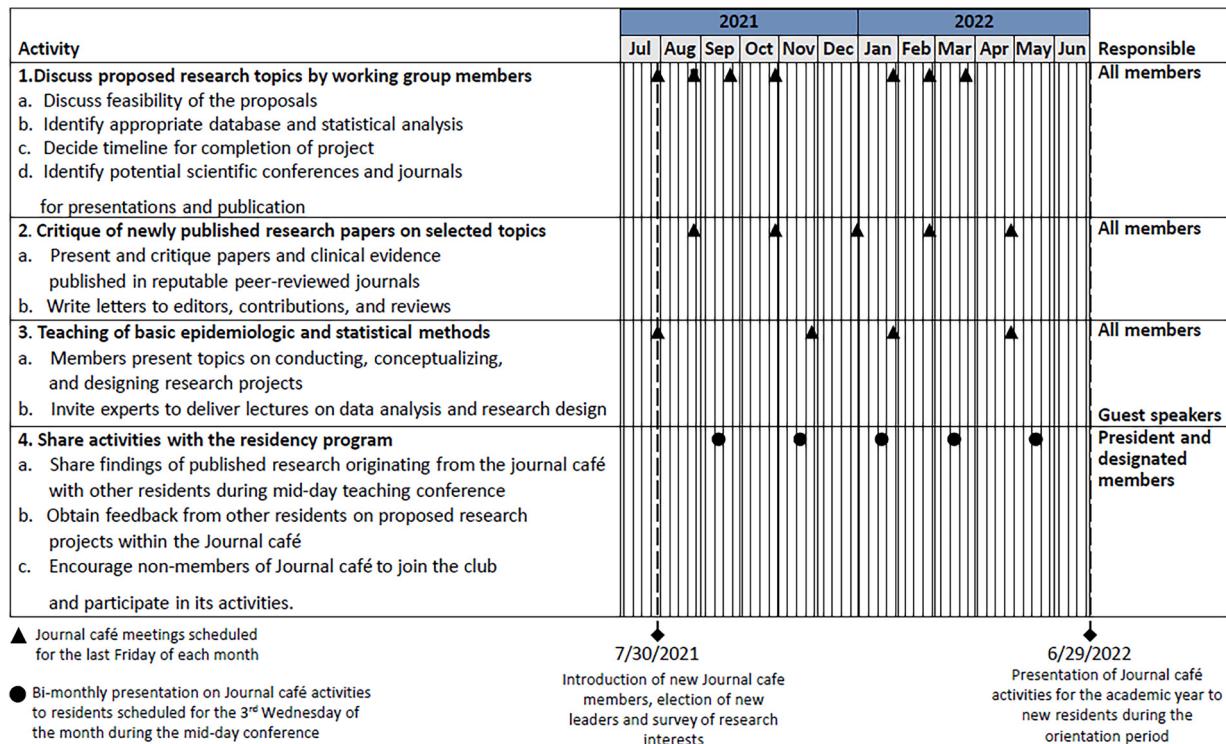


Figure 1. Sample schedule of journal café activities for the academic year 2021–2022.

productivity during residency training.⁵ All categorical residents of the MSM internal medicine residency program were included in the study. Preliminary residents, non-residents, and residents from other specialties were excluded.

Participants’ socio-demographic data and responses to research activities specifically during residency training and after joining the journal café were collected and documented. Research conducted before residency training and joining the journal café was excluded. We categorized the research activities of residents between July 1, 2018 and June 30, 2021, into two broad groups to capture all ACGME-recognized scholarly activities: (a) Research publications (published abstracts and body of manuscripts in peer-reviewed scientific journals, contributions to book chapters, manuals for teaching or clinical practice and participation in quality improvement projects with published findings). (b) Scientific presentations (presentation of research work [oral or poster], including quality improvement activities at grand rounds, scientific meetings, and local or national conferences).

Statistical analysis

Data from the survey was exported to Microsoft Excel (Microsoft Corporation, Redmond, WA) using a double-entry method to prevent errors. All identifiable information was removed before analysis to maintain anonymity. Variables and results were presented with frequencies,

percentages, and bar charts. Differences in the characteristics, research publications, and scientific presentations between journal café members and non-members were compared using Chi-Square analysis with Egon Pearson correction for groups with small values. Free-text answers were analyzed using thematic analysis by coding the responses into frames based on recurring themes. Two different analysts independently synthesized the coding frames, which another analyst subsequently reviewed to ensure inter-rater reliability. Data analysis was performed using R version 3.6.3 (R Foundation).

Sample size calculation

Using a margin of error (E) of 5%, a confidence level of 95%, and predicted response distribution (r) of 50%, we estimated that a minimum sample size of 67 from the total population of 82 residents was needed to achieve statistical power. The sample size was calculated using the below formula.¹⁵

$$x = Z(c / 100)2r(100 - r)$$

$$n = N x / ((N - 1)E^2 + x)$$

$$E = Sqrt[(N - n)x / n(N - 1)]$$

“N” is the population size, “Z(c/100)” is the critical value for the confidence level “c”, “x” is the expected population, and Sqrt is the square root.

Table 2. Baseline characteristics and research productivity of respondents.

VARIABLES	JOURNAL CAFÉ MEMBERSHIP		P-value
	YES N (%)	NO N (%)	
Total, No (%)	29 (42.6)	39 (57.4)	.06
Age			.01
25–29	6 (20.7)	16 (41)	
30–34	18 (62.1)	17 (43.6)	
35–39	4 (13.8)	5 (12.8)	
>40	1 (3.4)	1 (2.6)	
Gender			<.001
Female	16 (55.2)	19 (48.7)	
Male	13 (44.8)	20 (51.3)	
Race			<.001
Asian	8 (27.6)	5 (12.8)	
Blacks	19 (65.5)	31 (79.5)	
Hispanic	2 (6.9)	0 (0)	
White	0 (0)	3 (7.7)	
Postgraduate year (PGY) Level			.14
1	7 (24.1)	14 (35.9)	
2	14 (48.3)	11 (28.2)	
3	8 (27.6)	14 (35.9)	
Advanced degree other than MD or equivalent			.07
Yes	5 (17.2)	4 (10.3)	
No	24 (82.8)	35 (89.7)	
Subspecialty fellowship interest			<.001
Yes	23 (79.3)	9 (23.1)	
No	4 (13.8)	22 (56.4)	
Maybe	2 (6.9)	8 (20.5)	
No of research publications during residency ^a			.03
None	3 (10.3)	23 (59)	
At least 1	26 (89.7)	16 (41.0)	
Number of scientific presentations during residency ^b			<.001
None	5 (17.2)	25 (64.1)	
At least 1	24 (82.8)	14 (35.9)	

Abbreviation: MD, doctor of medicine degree

^aPublished abstracts and body of manuscripts in peer-reviewed scientific journals, contributions to book chapters, manuals for teaching or clinical practice and participation in quality improvement projects with published findings).

^bScientific presentations (presentation of research work [oral or poster], including quality improvement activities at grand rounds, scientific meetings, and conferences).

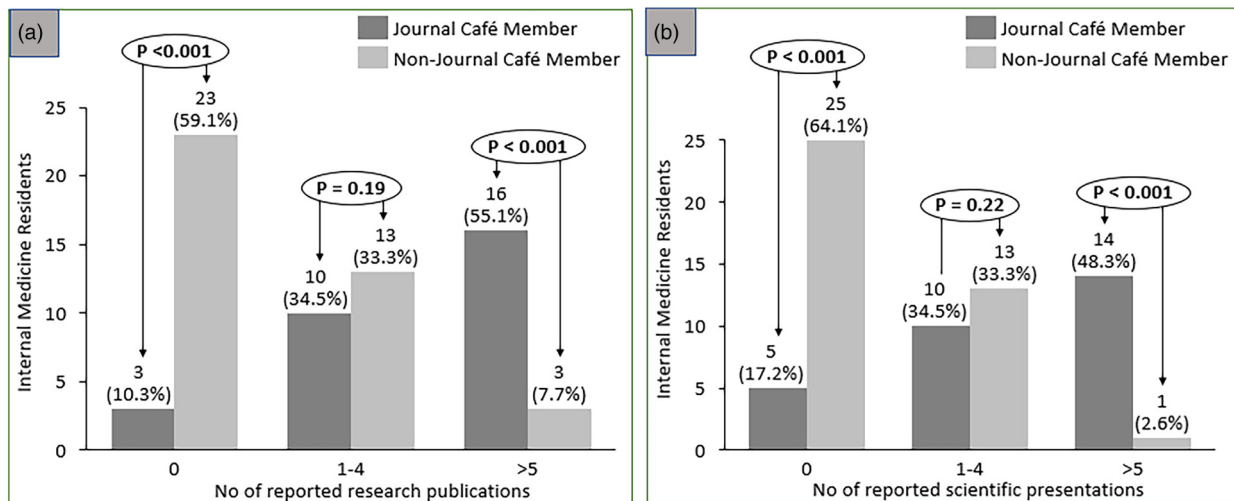


Figure 2. (a) Distribution of research publications between journal café members and non-members. (b) Distribution of scientific presentations between journal café members and non-members.

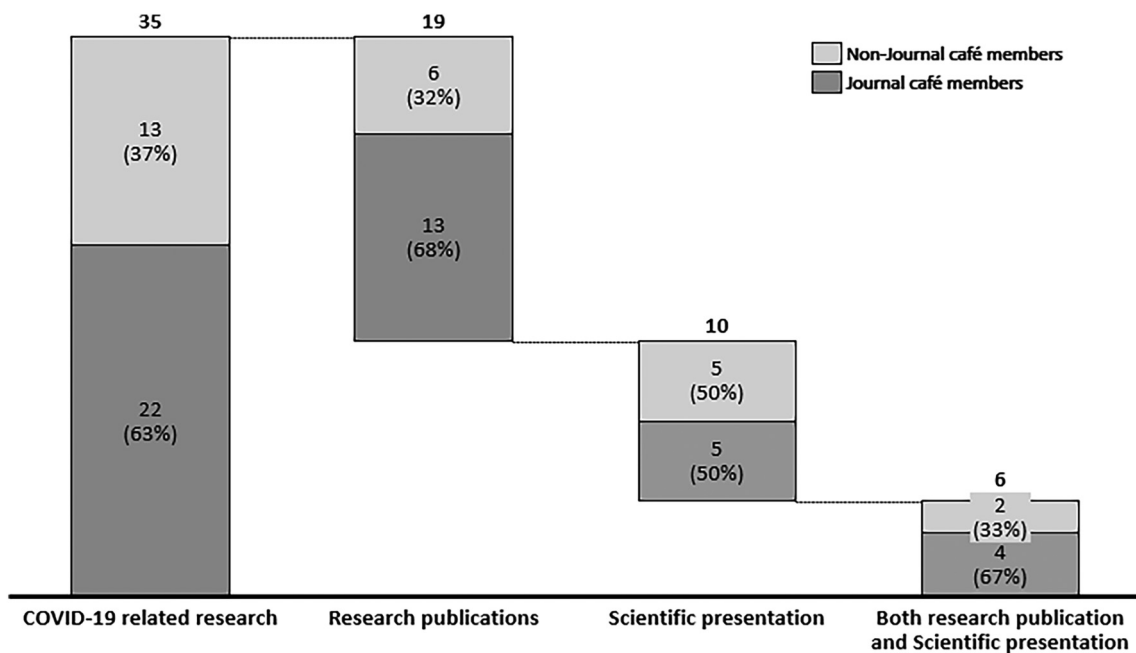


Figure 3. Breakdown of COVID-19 related research among journal café members and non-members. Survey questions: "Have you conducted COVID19 related research? If yes, how many COVID-19 research peer-reviewed articles have you published?" "How many COVID-19 related research have you presented at local or national scientific conferences publications and/or scientific conferences?".

Results

A total of 68 residents (29 journal café members and 39 non-members) completed the survey corresponding to a response rate of 85%. The mean age group was 30–34 years in both groups. There were more females (55.2%) in the journal café group and more males among journal café non-members (51.3%). Most journal café members (48.3%) were in post-graduate year 2 (PGY -2) (Table 2). More journal café members were interested in pursuing subspecialty fellowship training after residency, compared with non-members (79.3% vs 23.1%, $P < .001$). More journal café members

reported having at least one research publication (89.7% vs 41.0%, $P = .03$) and scientific presentation (82.8% vs 35.9%, $P < .001$) compared with non-members (Table 2). Likewise, a significantly higher number of journal café members reported having five or more research publications (55.1% vs 7.1%, $P < .001$) and scientific presentations (48.3% vs 2.6%, $P < .001$) compared with non-members (Figure 2).

About half of the respondents ($n = 35/68$) reported conducting COVID-19-related research, out of which 22 (63%) were journal café members, and 13 (37%) were non-journal café members (Figure 3). More journal café members published

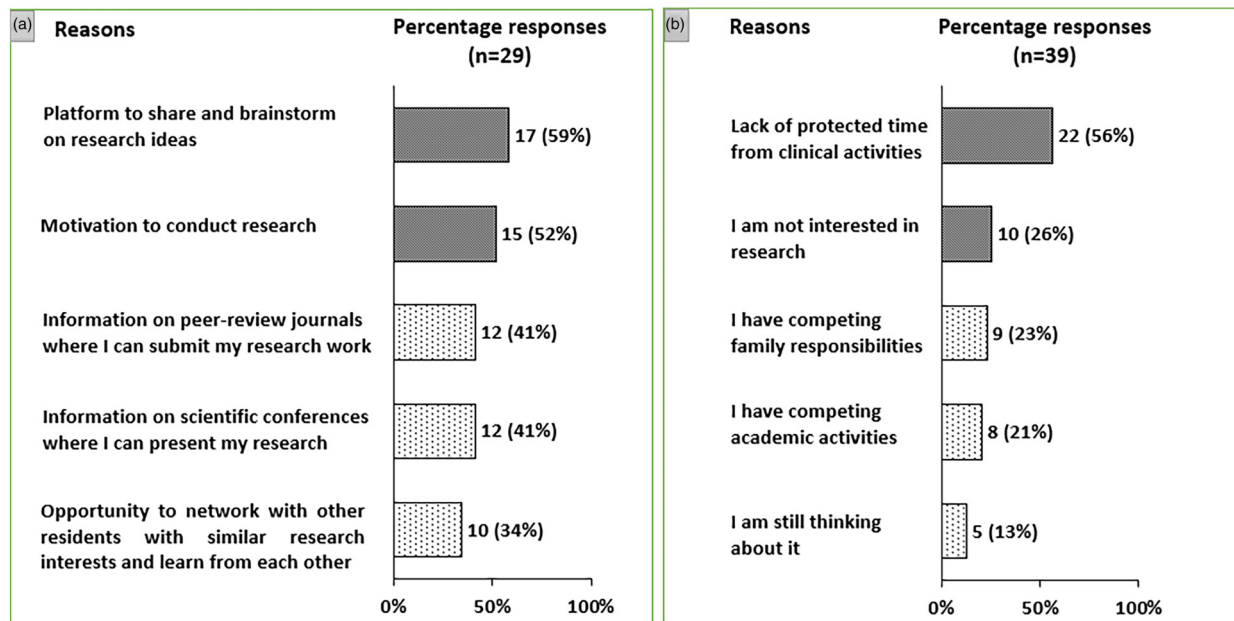


Figure 4. (a) Reasons provided by residents for joining the journal café. Survey question: “Provide reasons for joining the journal café.” (b) Reasons provided by non-member residents for not joining the journal café. Survey question: “Provide reasons for not joining the journal café.” Respondents provided multiple answers in some instances.

COVID-19-related research in peer-reviewed journals (68% vs 32%, $n = 19$). However, there was no difference in the number of presentations at scientific conferences between the two groups (Figure 3).

Reasons cited by most of the residents for joining the journal café were the opportunity of a platform to share and brainstorm on research ideas (59%) and motivation to conduct research (52%) (Figure 4a). Other reasons were the access to information on peer-review journals and scientific conferences where research works can be published and presented and the opportunity to network with other residents with similar research interests and learn from each other. Conversely, most non-members reported not joining the café due to a lack of protected time from clinical activities (56%) and no interest in research (26%). Other reasons were competing academic and family responsibilities and indecision (Figure 4b).

Discussion

Participation in a resident-led research club (journal café) independent of the residency program’s journal club correlated with higher scholarly productivity at our institution. Members of the journal café had a significantly higher number of research publications and presentations at scientific conferences than non-members. Also, the journal café appeared to have effectively sustained and increased scholarly productivity during the COVID-19 pandemic. Notably, our journal café model is unique because it is independently run by residents and complements the residency program’s traditional journal club rather than the implementation of supplementary curriculum and

modification of journal club activities reported by some residency specialties in the literature.^{12–14}

Internal medicine residents interested in pursuing subspecialty fellowship after residency were more likely to join the journal café, which is unsurprising because studies have shown that a high number of research publications and involvement in academic scholarship during residency is associated with success in the fellowship match.^{16,17} Similarly, most residents apply to fellowship programs at the end of PGY-2 and the beginning of PGY-3, which likely explains the predominance of PGY-2 residents in the journal café membership. However, regardless of future fellowship interests, we believe it is essential that internal medicine residents get involved in academic research activities to improve their ability to critique new evidence and appropriately apply clinical guidelines in clinical practice.

The COVID-19 pandemic significantly and adversely impacted residency training and academic scholarly activity.^{9–11,18} Due to the dynamic nature and continuously evolving understanding of COVID-19 both as a disease entity and public health emergency, there was a need for rapid and timely generation and dissemination of evidence.^{19,20} Journal café members were much more involved in COVID-19 research because we implemented a COVID-19 research committee within the journal café to collect and analyze data on hospitalized patients with COVID-19 infection at Grady Memorial Hospital (GMH), Atlanta, GA. GMH is a safety-net hospital and the primary training hospital for MSM internal medicine residents, and served as a large referral center for patients during the COVID-19 pandemic.²¹ Findings from the analysis were

published in peer-reviewed journals and presented at scientific conferences to influence the medical management of COVID-19 patients.^{22–24}

Residents find the journal café a platform to collaborate with other residents and share and discuss research ideas with colleagues with common goals and interests. We believe the success of the journal café can be attributed to financial and academic support from the residency program as well as strong commitment from members to the goals of the journal café. Most non-members expressed a desire to join the journal café but would prefer to have protected time from their clinical workload consistent with the oft-cited reasons reported by other residency programs in the literature for the lack of sustained interest in the journal club among residents.^{25,26} Nevertheless, our journal café initiative proves that residents may be more motivated to participate in a research club if working in groups with shared interests despite competing clinical duties.

Our study has some limitations. Selection bias could have partly accounted for differences in scholarly activity between journal café members and non-members, as residents with research interests may be more likely to join the research club and vice-versa. The survey instrument was not pilot-tested due to the relatively small sample size. However, it was reviewed by the institution IRB for appropriateness. Though survey responses were self-reported with possible inconsistencies, the research publications and scientific presentations were verified using research search engines; Google Scholar, PubMed, Embase, and Scopus. We also recognize that our journal café model may not directly apply to other residency programs and specialties due to institutional differences and variations in specialty training. However, we believe the concept can be adapted by other programs to improve scholarly productivity.

Conclusion

We found an association between participation in a resident-led research club initiative and increased scholarly activity, particularly during the COVID-19 pandemic. Independent resident-led research clubs supported by the residency program may complement the traditional journal clubs and enhance residents' participation in research.

Author Contributions

TO was the journal café coordinator during the 2018–2019 residency academic year. TA was the journal café president during the 2020–2021 residency academic year. VE was the journal café president during the 2018–2019 residency academic year. CC is the current program director of the Morehouse School of Medicine internal medicine residency program. CI is the current graduate medical education associate dean and designated institutional officer and was the MSM internal medicine residency program director during the 2019–2021 academic year. NB is an associate professor of internal medicine at MSM and the journal café faculty

advisor. All the authors contributed to the writing and critical revision of the manuscript.

Supplemental material

Supplemental material for this article is available online.

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