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ORIGINAL ARTICLE

PM&R

Diving into debate: Comparing discussion-based and single-presenter journal club formats in a large PM&R department

Sandra L. Hearn MD | **Sean R. Smith MD**

Department of Physical Medicine & Rehabilitation, University of Michigan Medical School, Ann Arbor, Michigan, USA

Correspondence
Sandra L. Hearn, Department of Physical Medicine & Rehabilitation, University of Michigan Medical School, Ann Arbor, MI 48108, USA.
Email: slhearn@med.umich.edu

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Abstract

Background: Journal clubs in physical medicine and rehabilitation (PM&R) advance the educational mission by uniting colleagues to learn of literature updates, consider clinical applications, practice critical thinking, and engage in lively dialogue and community. Although discussion-based journal clubs have been shown to enhance quality, a model for their application across a large and clinically diverse department of PM&R has not been described, nor has one been evaluated in comparison to a single-speaker podium format.

Objective: To develop a discussion-based PM&R department-wide journal club, present elements of the journal club model in a manner that would enable replication, and assess effectiveness as perceived by participants, compared to the prior (podium-based, single-speaker) format. It was hypothesized that a discussion-based journal club would more effectively achieve educational goals and would be perceived by participants to be of greater quality and value.

Design: Pre-post educational intervention study, using surveys of PM&R resident and faculty participants. Survey items used a 5-point Likert scale. Unpaired 2-tailed *t*-tests were used to compare the formats.

Setting: A large academic PM&R department.

Participants: PM&R faculty, residents, fellows: 26 respondents (preintervention) and 26 respondents (postintervention) out of a total of 94 and 98 people invited to participate, respectively.

Interventions: A discussion-based departmental journal club was designed and implemented, replacing the previous single-speaker, podium-based journal club.

Main Outcome Measures: Pre- and post- intervention respondent ratings of (a) journal club quality and value, and (b) effectiveness in achieving specific educational goals.

Results: Compared to the traditional format, the discussion-based format more effectively met the educational objectives, was of higher quality and value as perceived by respondents, and increased desire to attend the activity.

Conclusions: This discussion-based journal club format can serve as a model for academic PM&R programs looking to enhance the educational value of journal club.

INTRODUCTION

Journal clubs have been a mainstay in physical medicine and rehabilitation (PM&R) education for decades. In a 1995 survey of chief residents from all accredited PM&R programs, all respondents had some form of journal club in their programs (89% response rate)[1]; yet, the journal clubs varied in form and purpose. Cited goals include disseminating information from the current literature, shaping clinical practice, and teaching participants study design and critical appraisal of the scientific literature. Journal clubs have been shown to improve reading habits, knowledge of clinical epidemiology and biostatistics, use of medical literature in

clinical practice, and social interaction and community in an academic department.[2]

The goals of journal clubs in PM&R programs must adapt to meet the demands of a rapidly evolving field. The exponential growth in the amount of PM&R literature published each year[3] raises the challenge of keeping pace with advances and elevates the importance of thoughtful consumption of the literature. The specialty's increasing specialization and incorporation of new diagnostic and therapeutic tools require a vigilant surveillance of the evidence base. In a systematic review of journal clubs in graduate medical education, Ebbert et al describe a shift, over decades, toward a purpose of teaching of epidemiology, biostatistics, research design, and clinical decision making.[2] The goal of teaching critical appraisal skills may have eclipsed keeping up with the literature as a primary goal for many journal club leaders.[4,5] These shifts in priorities underscore the value of a discussion-based journal club as a forum for skill development, as opposed to pure knowledge dissemination.

Another purpose that journal club can serve is enhancement of social interaction and community. As the field of PM&R grows, departments expand, and knowledge becomes increasingly accessible through mobile devices, uniting people in conversation over common interests may hold increasing value to our communities. In discussing and analyzing a journal club article, faculty, trainees, and allied health professionals connect in a way that is, ideally, engaging and enjoyable. Such encounters, especially for trainees and junior faculty, may spark professional connections, interest in academic career paths, and research collaborations. To this end, Ebbert et al encourage the community to explore interpersonal outcomes like satisfaction with training and social cohesiveness, in addition to the more cognitive measures, when considering the value of journal club.[2]

Guiding discussion-based journal club development, several previous studies have identified factors associated with success. Mandatory attendance,[4-7] a committed and designated leader,[4,6,8] a stable recurring meeting schedule with protected time,[5,6,8] and attribution of high value by department leadership[6,7] create environments in which both experts and novices can unite consistently in an engaging community centered on learning. Presence of experts enables connection of the material with the immediate work experience, allowing discussion of whether, how, and under what circumstances clinical practice should change.[4,8] Other factors that enrich education center on how conversation is directed; these include active participation in a discussion-based format,[6] moderator skill,[6,7] anchoring a conversation with goals and structure,[6-8] resident leadership of presentation,[5] and seating participants in a circle.[7] The discussion-based format enables incorporation of principles of adult learning,[4,6] in which participants apply their knowledge to appraise manuscripts and solve problems together, while directing their own learning through the flow of conversation and through receiving feedback in real time from experts. Sufficient preparation by the moderator and participants facilitates this environment.

Implementation of aspects of a discussion-based format has been previously published. Two programs—in emergency medicine[9] and in internal medicine[10]—systematically restructured their residency-centered journal clubs. Both groups described a purposeful shift toward discussion-based learning, with both experts and novices present. Assigned leadership that included residents and clearly delineated guidelines for preparation were identified as important premises driving success.

Although discussion-based journal clubs have been shown to enhance quality, a model for their application across a clinically diverse department of PM&R has not yet been described nor has one been evaluated in comparison to a single-speaker podium format. We present a discussion-based journal club format, developed to replace a podium-based, single-speaker presentation format (Table 1). The goals of the new format were to improve the educational value of the activity, including deepening our ability to critically interpret results to understand the scientific merit of a manuscript. This paper describes the results of our prospective comparison of a discussion-based journal club versus a traditional, single-speaker presentation format and presents the key features of our journal club model in a manner that can be replicated.

METHODS

Previous (traditional) journal club format

Previously, the [Michigan Medicine] PM&R resident-led journal club (traditional format) consisted of a set of two formal 25-minute slide presentations reviewing a paper, each presented by a different resident. The journal clubs occurred six times per year during business hours. The target audience was physicians, but nonphysician faculty were encouraged to attend. Attendance was mandatory for residents and encouraged for faculty and fellows, and attendance averaged 33 participants (among a department with approximately 94–98 physician faculty, fellows, and residents). Videoconferencing technology enabled remote listening by off-site faculty.

Quality assessment of the traditional journal club

A quality assessment was sent to faculty and trainees before implementation of a discussion-based journal club

TABLE 1 Comparison of traditional and new journal club formats

	Comparison	
Features	**Traditional format**	**New format**
Format	Podium talk with PowerPoint slides; limited discussion	Fluid, discussion based
Scope	Two papers (25 min each); often lack of time to finish	Single paper over 50 min
Preparation	Minimal audience preparation	Thought questions distributed to audience in advance for consideration
Leadership	Resident presenter	Resident leads discussion with faculty mentor
Space	Audience in rows facing podium	Participants sit in a circle
Videoconferencing	Remote audiences see slides	Remote audiences see participants
Faculty participation	Limited faculty input	Frequent faculty input; discussion of whether and how findings translate to practice

format, in which respondents evaluated the effectiveness of the existing schema on a 5-point Likert scale in the following categories: fostering high-quality discussions, teaching how to effectively pursue and apply evidence-based medicine, considering applicability of findings, developing skills in interpretation of results, teaching principles of research methods and study design, and providing adequate scientific context for presented articles. The survey also invited participants to rate journal club subjectively with regard to overall value and overall quality and to enter open-ended comments about the format and experience. Nine months postintervention, a follow-up survey with the same items was administered. For each ranked item, mean ratings of the traditional and new journal club formats were compared using an unpaired 2-tailed *t*-test accounting for equality of variance between comparison groups. Post hoc subset analyses evaluated trainee (resident and fellow) responses and physician faculty responses separately.

Finally, the postintervention quality assessment measured subjective preference and enjoyment, assessing whether the format was favorable compared to the prior format and whether it increased desire to attend journal club.

The research plan was submitted to [Michigan Medicine]'s institutional review board and deemed to not require regulation.

Development of the new journal club format

Based on preintervention survey results, a new journal club format was implemented with several principles in mind:

- *Implementation of discussion-based format*: Slide deck presentations were eliminated. Participant seating was arranged in a large circle, in lieu of rows. The videoconferencing camera, for remote attendees, was redirected to capture most of the live audience rather than a single speaker.
- *A more in-depth review of a single article during the session*: Each journal club focused on only one paper (compared to two in the previous format) and took the form of a 50-minute in-depth discussion. This time frame allowed greater exploration of study design, placement of findings in scientific context, and consideration of potential clinical applicability.
- *Establishment and dissemination of clear guidelines and roles*: Journal club guidelines, including learning objectives and the roles and responsibilities of the presenting resident, faculty mentor, and active participants, were shared in advance of the intervention.
- *Faculty mentorship designated in advance*: Faculty mentors were identified and invited by educational leaders at the start of the academic year, as opposed to just before the planned journal club. Mentors were encouraged to assist with paper selection, identifying and recommending those with high learning value regarding either clinical impact or understanding of study design. The faculty mentor's name was listed and announced with each presentation, formalizing both credit and responsibility for the session.
- *Thought questions distributed in advance*: The journal club article, as well as at least two thought questions prompting critical thinking about study design or applicability and a teaching point (usually related to biostatistics, study design, or methodology) were developed by the presenting resident, with faculty mentorship, and shared electronically at least 1 week in advance of each session. The questions served to engage participants in critical thinking before the journal club, enabling deeper exploration during the session. Building the thought question was also intended to help the presenting resident learn and prepare.
- *Alignment of topics with resident didactic cycle*: Six journal clubs spaced roughly 2 months apart each addressed the topic domain of the associated didactic block about which trainees were already learning

(eg, traumatic brain injury or musculoskeletal medicine). For resident participants, this topic alignment enabled preparation to serve as part of their routine focused learning.

- *Involvement of prominent faculty leadership*: We invited the department chair to co-lead a session on education in PM&R, providing positive philosophical support for the activity.[6] The session enabled a resident to work closely with him and for all participants to engage in a discussion that, based on topic choice, addressed the role of the residency in the future of our field.

RESULTS

Although average journal club attendance was 33 participants (of whom approximately 50% were trainees), all current faculty (physician and nonphysician), fellows, and residents received the survey (n = 94–98 surveyed). Response rate was 28% (26/94) on the first survey (eight trainees, 16 faculty, two nonphysician faculty) and 27% (26/98) on the second survey (15 trainees, nine physician faculty, one nonphysician faculty, one did not identify), with most responses coming from individuals who regularly attended journal club and fewer than three responses on each survey from individuals who participated less than once per year. An adjusted response rate, using average journal club attendance (33 participants) as the participant pool, was 79% (26/33). Relative representation of trainees versus faculty was significantly higher on the second survey (58%) than the first (31%). Between the two sets of survey responses, 23% of the responses represented individuals common to both groups surveyed (6/26); the remainder of responses came from individuals who responded to only one of the two surveys, with nonoverlap representing a combination of personnel turnover between academic years and differential responsiveness of individuals between survey administrations.

Effectiveness ratings across all six learning objectives were lower for the traditional journal club than for the discussion-based journal club (Figure 1A). Comments from the first survey identified that respondents perceived format weaknesses that affected:

- Ability to translate literature into practice. (Representative comment: "*The residents learn a lot about the articles, but the lack of discussion gives no clinical context so the idea of moving the literature into practice does not occur.*"
- Trainee enjoyment of the activity. (Representative comment: "*The formality of the presentation pulls [the trainees] from the intent of journal club. It seems it is less fun for them than it could be and I want them to enjoy it!*")

In addition, the discussion-based format was rated more highly for quality and value by respondents

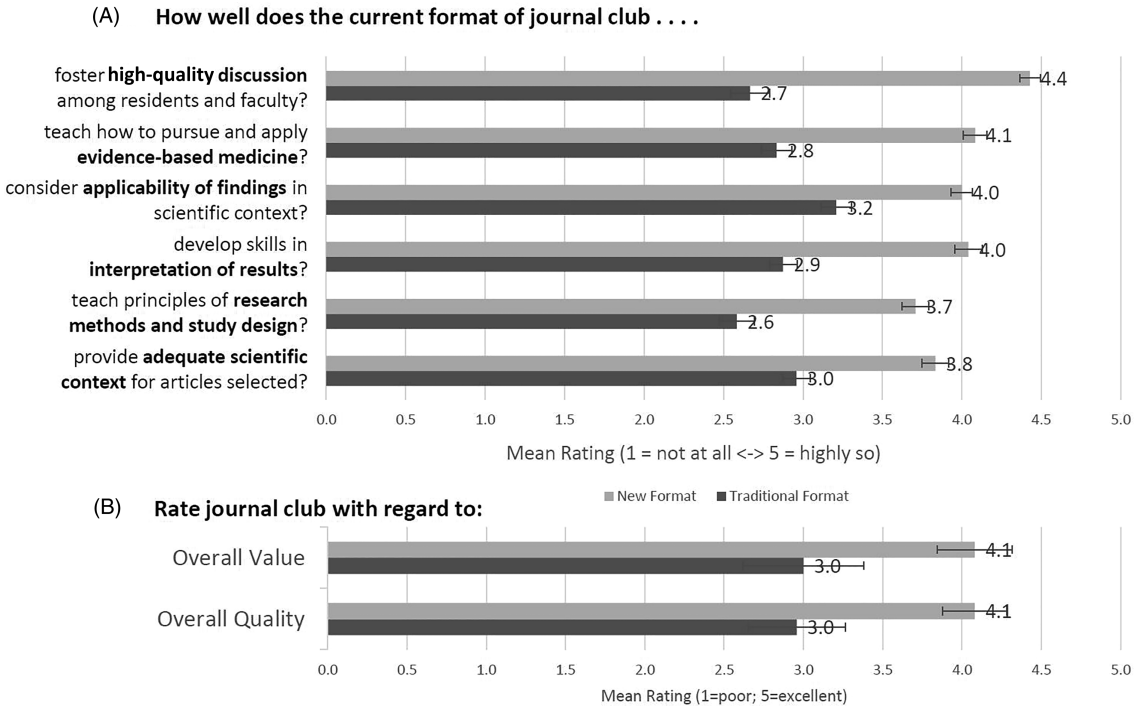

FIGURE 1 Survey of journal club participants: respondent ratings of new and traditional journal club formats for (A) learning objectives, and (B) overall value and quality. Error bars represent 95% confidence intervals of the means

(Figure 1B) and was perceived by respondents to increase desire to attend the activity (Figure 2). All eight *t*-test comparisons between mean ratings of the traditional and new journal club formats showed differences in favor of the new format (significant at the $p < .05$ level). Comments addressed the discussion-based format and engagement:

"*I liked the engagement that came from sitting in a circle. People thought and spoke, so it was infinitely better than the previous model.*"

Given the substantial difference in proportion of trainee responses on the preintervention versus postintervention surveys, a post hoc subset analysis was performed, independently comparing trainee (resident and fellow) and physician faculty responses across the intervention (Table 2). For the subset analysis, one physician faculty response was excluded at each timepoint because of incomplete data (not all survey items were answered). Overall, a greater improvement from the journal club format change was perceived by trainees than by faculty, although both groups perceived the new format to be of higher quality and value overall. Regarding effectiveness, the new format of journal club was rated significantly more effective across all six specific aspects by trainees. Among faculty, provision of scientific context and teaching applicability of study results were not statistically significantly different between formats.

DISCUSSION

The new journal club format, compared to the previous single-speaker format, more effectively engaged trainees and faculty and met the intended objectives. Our results show that implementation of an active, discussion-based journal club format can succeed in a large PM&R department with diverse clinical subspecialties represented. Emphasis on deliberate mentorship and on resident leadership of discussion—both during the session and via a thought question shared in advance—were strong premises driving implementation. The new format appears to be sustainable and continues over 2 years later.

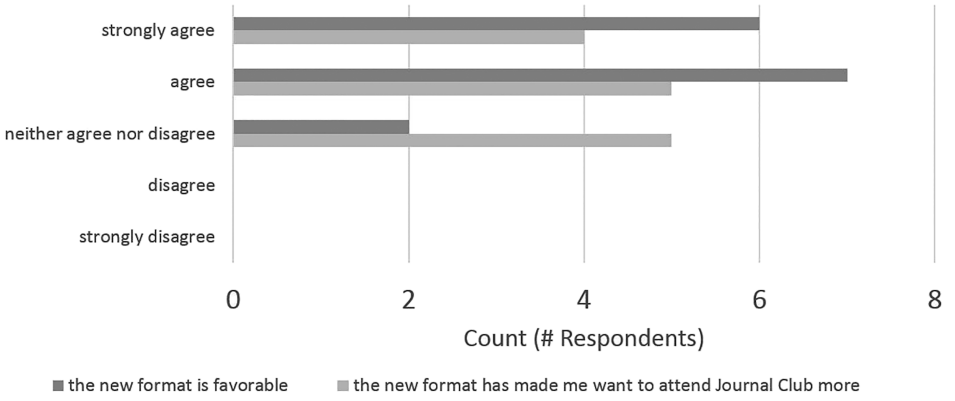

FIGURE 2 Perception of new journal club format

TABLE 2 Subset analysis of journal club ratings, with independent comparisons across the intervention for trainees and for faculty

	Trainees (residents/fellows) only			Physician faculty only		
	Mean rating			Mean rating		
How well does the current format of journal club…	Traditional (n = 8)	New (n = 15)	*p* value	Traditional (n = 15)	New (n = 8)	*p* value
Provide adequate scientific context for articles selected?	2.75	4.20	< .001	3.13	3.38	.500
Teach principles of research methods and study design?	2.00	3.40	< .001	2.93	4.12	.002
Develop skills in interpretation of results?	2.63	4.01	< .001	3.07	4	.027
Consider applicability of findings in context of our current scientific understanding?	2.88	4.13	< .001	3.40	3.75	.386
Teach how to effectively pursue and apply evidence-based medicine?	2.38	4.07	< .001	3.13	4	.043
Foster high-quality discussion among residents and faculty?	1.75	4.40	< .001	3.27	4.38	.003
Rate journal club with regard to:						
Overall quality	2.63	4.13	< .001	3.21	4	.013
Overall value	2.38	4.13	< .001	3.40	4	.033

Successful implementation of a discussion-based journal club is important, as this format complements and builds upon the interactive learning methods offered in many modern medical school curricula. Context-based problem-solving involving other professionals—from clinical case-based discussions to analysis of relevance and applicability of study findings through a journal club—promote lifelong learning and professional development, in part through self-regulated learning. Self-regulated learning is defined as a complex interactive process involving cognitive and motivational self-regulation[11]; it emphasizes learner autonomy and modulation of own learning and is shaped by the interaction between the individual and the context,[12] including social environment and professional relationships.[13] A discussion-based journal club provides the relevant context of a lively, inquisitive and goal-oriented congregation of professional colleagues in which to sculpt scientific inquiry.

This study has several limitations. Assessment of journal club effectiveness was by perception only and did not include evaluation of participant knowledge, skill, or reading habits. Furthermore, the low survey response rates render data vulnerable to bias. That many nonrespondents were individuals who did not routinely attend journal club helps to mitigate this concern; approximately 27 nonphysician faculty (psychologists and research faculty) received the survey who neither routinely attended journal club nor responded to the survey. A more meaningful response rate estimate, limiting the sample to physicians who attended journal club more regularly, is 79% (26/33 participants). Another limitation related to survey response rates is the relative overrepresentation of trainees versus faculty on the second survey, an outcome that may bias conclusions toward a trainee perspective. Also possible is that the respondent pool may have been enriched for those who favor a discussion-based journal club format and that the implementation of a significant format change and the associated energy and engagement may have fostered a perception of improvement, independent of the specific format. Both biases would overestimate the perceived value of the intervention. Long-term follow-up will be needed to measure a lasting effect of the intervention.

Next steps in journal club development include better preparing resident and faculty moderators to lead an effective discussion. One survey respondent (postformat change) noted:

> "*I'd like to see some more structure from the presenting resident. The past few I've attended the resident just jumps into discussion, or will ask members of the audience to explain the article background or methods. Have you tried asking the presenting resident to give a short article summary before launching into the discussion? I think it would help with providing more structure at the beginning of the session.*"

Indeed, determinants of journal club effectiveness noted by others include moderator skill, as well as provision of a structured review instrument or other set of guidelines to aid participants in critical analysis of the article.[6,7] We do not currently offer training in moderation of small group discussions, and the emphases of the critical analyses performed are currently heterogeneous, based on leading resident and faculty preference. Providing moderator training and an agreed-upon approach to article review are desirable next steps in our activity planning. Seeking feedback and perspective of the presenting resident would also steer further developments and inform need for moderator training.

In addition, the nature and integration of the "teaching concept" into the journal club discussion have been variable. Previous studies have suggested that training in epidemiology, biostatistics, and evidence-based medicine increases journal club effectiveness.[6-8] Incorporating this training, whether through structured development of teaching concepts or through an adjunct section of the curriculum, would likely increase the ability of participants to analyze articles, heightening journal club value. Future directions may include instructing the presenting resident to select one item from a menu of teaching concepts drawn from epidemiology, biostatistics, and study design. This approach could enable systematic integration of an evidence-based medicine curriculum with journal club in a manner that promotes both understanding and application of principles in the same setting.

Finally, with a recent shift in educational activities to virtual settings, further work should focus on whether and how the educational and community-building goals of discussion-based journal club can be maintained and enhanced in a virtual format. Our preliminary anecdotal experiences have suggested several effective strategies: (1) more deliberate preparation and framing of teaching concepts by presenters, (2) designating several participants in advance to summarize and critically analyze portions of data, and (3) use of the electronic chat to facilitate moderated verbal participation (eg, instructing participants to mark "X" to indicate desire to speak or "@Name" to follow someone's comment, to enable organization of discussion by the moderator).

CONCLUSION

Transition toward a discussion-based journal club in a large academic PM&R department can increase satisfaction and perceived educational value. Designated faculty mentorship, resident leadership of discussion, clear guidelines for preparation, and sharing of questions to stimulate thought in advance are

considerations that may facilitate an engaging, valuable, and enjoyable discussion among trainees and faculty.

DISCLOSURES

None

ORCID

Sandra L. Hearn https://orcid.org/0000-0002-9748-697X
Sean R. Smith https://orcid.org/0000-0001-9936-8750

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