Understanding the Modern Surgical Journal Club

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OBJECTIVE: We sought to perform a comprehensive review of how journal club (JC) is utilized in surgical residencies, including the goals, structure and outcomes of the educational activity, and any changes made since the 2003 implementation of the 80-hour weekly resident duty hour limit.

DESIGN: A random, representative cohort of 75 of the 266 US general surgery residency programs was identified, and Program Directors were asked to complete an 18-question electronic survey about to the ways in which their program utilizes JC.

SETTING: General surgery residency programs of all types, sizes, and in all geographies.

PARTICIPANTS: Seventy-five general surgery Program Directors were contacted, 42 of whom (56%) completed the survey.

RESULTS: Most programs hold JC monthly (60.6%). University programs were more likely than others to hold JC during the evening or other nonprotected time ($p = 0.04$) and estimated the lowest proportion of residents in attendance (58.3%, $p = 0.03$). Twenty-one percent of programs indicated changes to JC related to the 80-hour work per week including making meetings less frequent and also optional. While 71.4% of respondents indicated that teaching biostatistics is a goal of JC, over half (57.1%) stated it is slightly or not at all effective at doing so.

CONCLUSIONS: JC is prevalent and, despite being 1 of its main goals, is not effective at teaching residents about biostatistics in its current form. Developing realistic, targeted curricula about biostatistics as adjuncts to current JC activities may help programs achieve these goals more readily. (J Surg Ed 76:637−643. © 2018 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

KEY WORDS: journal club, education, medical, graduate, internship and residency, evidence-based medicine

COMPETENCIES: Practice-Based Learning and Improvement, Medical Knowledge, Interpersonal and Communication Skills

INTRODUCTION

Evidence-based medicine (EBM) is an important factor in the practice of surgery, especially as the care of surgical patients continues to become more specialized and the complexity of clinical research continues to increase.[1] Medical schools include courses on statistics and epidemiology in their curricula in an attempt to prepare students for critical review of the literature once they reach their clinical practice. However, Bhandari et al. demonstrated that surgical residents do not implement or practice EBM due to 4 primary reasons: lack of education, time constraints, lack of priority, and staff disapproval.[2] Surgical residency programs control most of these factors, though resident education is likely the most easily modifiable.

While it is true that most surgical residents are able to read a manuscript in the literature and come away with a general understanding of its clinical conclusions, some may not be able to critically evaluate the strength and merits of the study, including its methods and data analysis.[3,4] Surgical residencies also vary widely in the amount of attention they give to their trainees' understanding of statistics and evaluating both specialty-specific and general medical literature.[3]

Journal club (JC) is an educational activity that has served as a way for attending physicians, trainees, and colleagues to collectively connect with the medical literature for over a century.[5] A 2001 survey of Program Directors revealed that JC continues to be a widely used educational activity in surgical residencies in which residents and faculty engage with current research papers applicable to their practice.[6] The authors found that despite being prevalent, there was little formal evaluation of the

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impact JC was making on resident education. While many medical educators hold the opinion that JC is a preferred and effective way to teach these critical appraisal and biostatistical skills, it is difficult to evaluate a direct impact of JC on these skills and their ultimate impact on patient care, and very few high-quality studies have been undertaken to demonstrate the magnitude of its benefit.[7-10]

In order to understand the impact, JC may have on critical appraisal, biostatistical, and clinical skills, the structure and goals of JC must first be evaluated. Very little research into the ways in which JC is actually used in surgical residency curricula has been performed. The few reports that exist are often limited in scope to 1 residency program, and results are therefore unable to be generalized.[3,11,12] One more comprehensive investigation surveyed Program Directors about whether biostatistical curricula were being implemented, but did not assess the methods or types of curricula or whether they intersected with other programs such as JC.[3] Additionally, the 2003 implementation of the 80-hour resident work week has diminished the amount of time, programs have been able to devote to didactic education sessions such as JC. Therefore, our aim is to conduct a contemporary, comprehensive, and representative survey of how JC is currently being used in general surgery residency programs, and to assess how recent demands on resident work hours have impacted JC.

MATERIAL AND METHODS

We developed an electronic 18-question survey intended for distribution to Program Directors to assess how JC is being used by general surgery residency programs (Appendix 1). Questions in the survey focused on the process through which the program implements JC, the goals and objectives of JC, and any alterations that had been made in the JC as a result of the 2003 implantation of the 80-hour weekly resident duty hour restrictions.

In order to develop the survey cohort, data were collected about the 266 general surgery residency programs in the United States from the American Medical Association's Residency and Fellowship Database (FREIDA). Data abstracted for each program included by program type (community, university-affiliated, or university), location, and number of residents per class (FREIDA provides number of first year residents since it is a tool used by residency applicants). Residency programs were grouped by location, type, and size and then programs were randomly selected from these groups in order to generate a representative sample of 75 programs. The Program Director of each program was contacted with a survey link by e-mail, and this was followed up with a telephone call if there was no response after 2 weeks.

Free-text responses were reviewed and grouped based on common themes. Utilizing SPSS statistical software (IBM, Armonk, NY), data were analyzed using *t* tests, 1-way ANOVA, and chi-square tests.

RESULTS

Of the 75 Program Directors contacted for participation, 42 responded, yielding a response rate of 56%. The programs that responded were similar in location, type, and

TABLE 1. Comparison of Characteristics of General Surgery Residency Programs Overall and Those in Study Cohort

		Overall	Cohort	p
n		**266**	**42**	
Region [n (%)]				0.44
	East North Central	43 (16.2)	7 (16.7)	
	East South Central	13 (4.9)	3 (7.1)	
	Mid Atlantic	56 (21.1)	10 (23.8)	
	Mountain	9 (3.5)	1 (2.4)	
	New England	19 (7.1)	4 (9.5)	
	Pacific	31 (11.7)	6 (14.3)	
	South Atlantic	52 (19.5)	6 (14.3)	
	West North Central	17 (6.4)	3 (7.1)	
	West South Central	25 (9.0)	2 (4.8)	
	Territory	2 (0.8)	0 (0.0)	
Type of program [n (%)]				0.79
	Community	30 (11.3)	8 (19.0)	
	University-affiliated	109 (41.0)	14 (33.3)	
	University	127 (47.7)	20 (47.6)	
First-year residents (Mean. ± S.D.)		4.8 ± 2.6	4.1 ± 2.5	0.17

TABLE 2. Characteristics of General Surgery Residency Journal Clubs Stratified by Program Type

n	Overall 42	Program Type: Community 8	University-Affiliated 14	University 20	p
Frequency (n [%])					0.08
Weekly	3 (7.1)	0 (0.0)	0 (0.0)	3 (15.0)	
Bi-weekly	1 (2.4)	1 (12.5)	0 (0.0)	0 (0.0)	
Monthly	25 (59.5)	6 (75.0)	9 (64.3)	10 (50.0)	
Bi-monthly	4 (9.5)	0 (0.0)	1 (7.1)	3 (15.0)	
Quarterly	8 (19.0)	1 (12.5)	4 (28.6)	3 (15.0)	
Annually	1 (2.4)	0 (0.0)	0 (0.0)	1 (5.0)	
Timing (n [%])					0.04
Workday: protected time	18 (42.9)	5 (62.5)	8 (57.1)	5 (25.0)	
Workday: nonprotected time	3 (7.1)	0 (0.0)	0 (0.0)	3 (15.0)	
Evening	21 (50.0)	3 (37.5)	6 (42.9)	12 (60.0)	
Industry support (n [%])	9 (21.4)	0 (0.0)	3 (21.4)	6 (30.0)	0.02
Number of faculty present (No. ± S.D.)	3.8 ± 2.9	2.3 ± 1.5	5.5 ± 4.3	3.3 ± 1.2	0.04
Percent of residents present (Mean ± S.D.)	67.2 ± 19.5	71.5 ± 26.2	77.8 ± 6.4	58.3 ± 19.5	0.03
Number of papers discussed (Mean ± S.D.)	2.9 ± 1.0	3.8 ± 1.2	2.8 ± 1.0	2.6 ± 0.8	0.04

S.D, standard deviation.

size when compared to all programs in the United States (Table 1).

All Program Directors who replied indicated that their program has a formalized JC as part of their residency's curriculum. Table 2 summarizes data related to how JC is conducted stratified by residency program type. Most programs (59.5%) hold JC monthly, and there was not a significant difference among program types with respect to the frequency of JC ($p = 0.08$). Half of the residency programs hold their JC in the evening. Both community and university-affiliated programs were more likely to hold their JC during protected educational time (62.5% and 57.1%, respectively) with university programs favoring evening sessions (60.0%, $p = 0.04$). University programs were the only programs to report holding JC during nonprotected hours during the work day (15.0%). Industry support of JC was also most prevalent among university programs and absent in the community setting ($p = 0.02$).

The distribution of attendance at JC varied across program type. Fewer faculty members are reported to attend JC at community programs (2.3 ± 1.5 vs 5.5 ± 4.3 and 3.3 ± 1.2) likely reflecting the smaller faculty. Despite the larger size of the program, significantly fewer residents attend JC at academic programs when compared to others (58.3% vs 71.5% and 77.8%, $p = 0.03$). Additionally, community programs discuss more papers on average at each JC session than other programs (3.8 ± 1.2 vs 2.8 ± 1.0 and 2.6 ± 0.8 papers, $p = 0.04$).

When asked if they had altered JC when implementing the 80-hour work per week restrictions, 21.4% of Program Directors said they had. The most commonly cited changes were scheduling JC less frequently or moving it from workday hours to the evening. Several programs also made attendance at JC optional. Additionally, 38.1% of Program Directors indicated that resident participation in JC is not part of logged duty hours; 81.3% of these programs hold their JC in the evening.

TABLE 3. Categorization of General Surgery Residency Program Directors' Responses About the Goals and Objectives of Their Program's Journal Club. Responses were Counted Multiple Times if They Mentioned More Than 1 Objective

Goal/Objective of Journal Club	n (%)
Staying current with the literature	16 (38.1)
Applying the literature to clinical practice	24 (57.1)
Understanding biostatistics	30 (71.4)

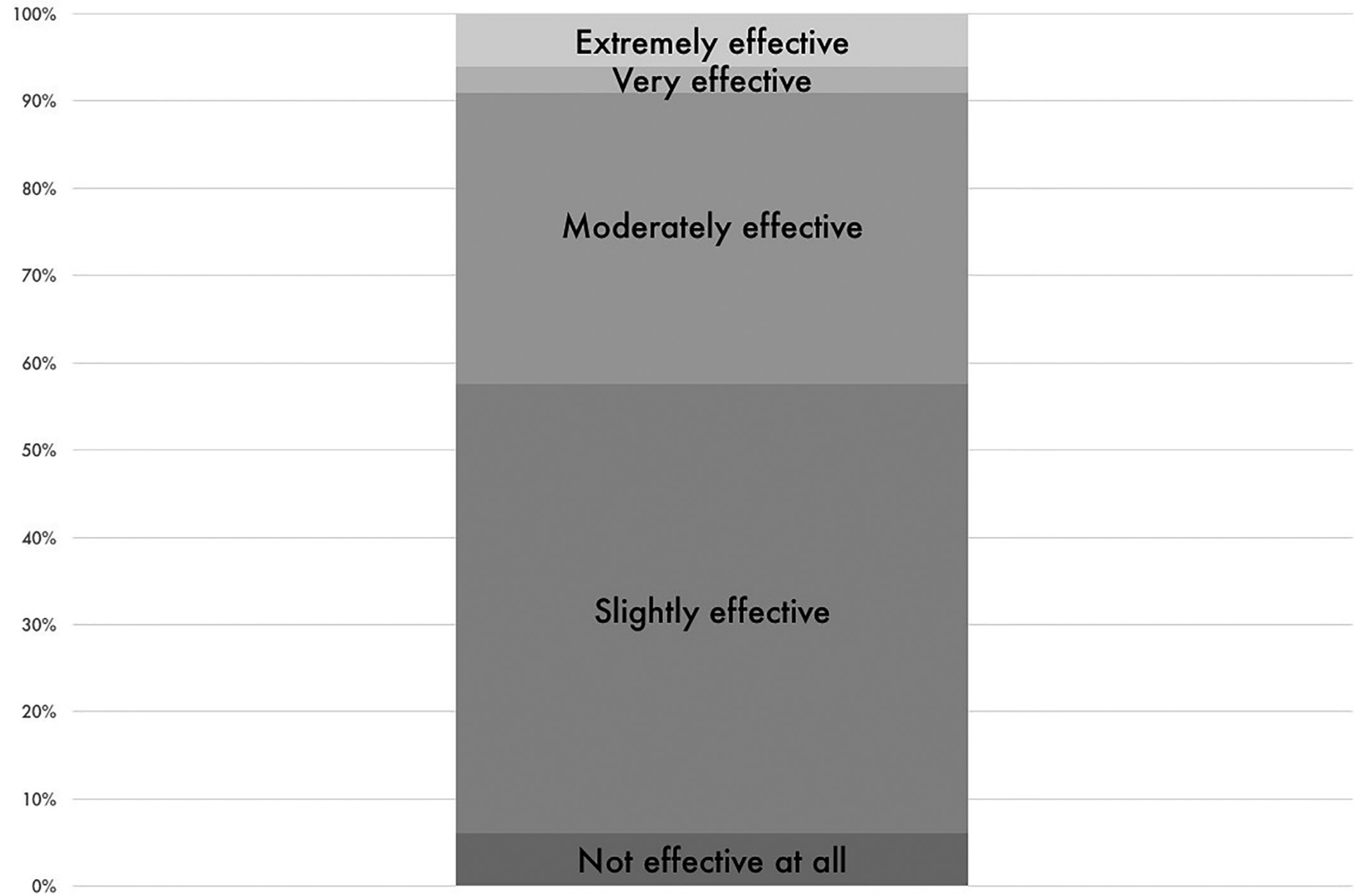

FIGURE 1. General surgery residency Program Directors' perception of how effective their program's journal club is at teaching biostatistics.

All Program Directors indicated that their JC has formal or informal educational objectives for JC. An initial analysis of these free-response replies revealed that all sentiments were easily grouped into 3 categories: staying current with the literature; applying the literature to clinical practice; and understanding biostatistics; they are summarized in Table 3. Several responses mentioned aspects of multiple categories and were therefore counted more than once. The understanding of biostatistics was the most frequently cited goal for JC (71.4%). Seventy-six percent of programs have at least an informal way of assessing and measuring progress toward these goals, and 81.3% of these programs indicate that they believe they are accomplishing them. Despite most responders indicating that teaching biostatistics is a goal of their JC, over half (57.1%) stated that their JC programs are slightly or not at all effective at teaching biostatistics (Fig. 1).

DISCUSSION

Utilizing a survey of a representative group of general surgery residency Program Directors, we confirmed that the use of JC remains prevalent. Despite this prevalence, we also demonstrated a wide diversity in implementation of JC both in frequency, organization and resident attendance. These differences were apparent when residency programs were classified by program type and may therefore reflect either different program priorities or logistics in implementing academic programs inherent to different residency sizes.

The frequency and resident attendance at educational sessions is of interest given higher clinical demand in shorter work hours after the implantation of the 80-hour work per week. We found that independent programs are more likely to have JC during protected educational time than academic programs, and that they have higher reported attendance. JC is more likely to be optional when held in the evening, and therefore limits attendance and the ability for programs to accomplish goals related to analysis of surgical literature and biostatistical analysis.

While responses were varied, overall the changes in JC structure that Program Directors cite after this implementation serve to decrease both frequency and attendance. Despite that the majority of Program Directors state that they rely on JC activities to teach their residents about biostatistical and EBM methods, many also do not believe that JC in its current form is actually effective at teaching these skills. It is therefore important to develop adjunct methods to improve the efficiency with which residents can gain experience in these areas.

Several programs have attempted integrating in-person or electronic instruction into JC and other educational activities to improve and augment resident education. Given the varied styles and methods of JC implementation, Dirschl et al. found that the use of a checklist in JC increased at least the perceived educational benefit of JC by residents.[12] Trickey et al. saw a rise in American Board of Surgery In Training Examination score after the integration of lectures about research methods into their curriculum.[13] Another group demonstrated that integration of lecture related to biostatistical methods into the JC curriculum increased scores about these methods when compared to a pretest.[3] However, given that time constraints on resident education are now greater, adding these in-person lectures is likely not practical for most residency programs. Attempting to decrease the face time required for these educational activities, McLeod et al. implemented a randomized controlled trial of an internet-based JC at 12 residency programs.[14] They found disappointing results related to participation rates and results on critical appraisal tests among residents assigned to the internet-based JC when compared to those who had an in-person JC.

Taken together, the results of our survey and these prior studies suggest the need for the development of realistic and high-impact curricula related to biostatistics and EBM. To both meet the goals stated by Program Directors in our survey and attempt to overcome challenges that previous groups have encountered, new curricula need to meet several criteria: they should not add to the face time required for resident education; they must be easily accessible for residents (digital, not time-consuming); and should not act as substitutes for JC and other in-person education session. Given the differences demonstrated in educational sessions such as JC across general surgery residency programs, the ability to adapt the curriculum to a variety of applications is essential. Once curricula are developed, implementation should be evaluated for effectiveness.

CONCLUSIONS

Despite alterations related to work hour restrictions, JC is widely used in general surgery residency programs. Program Directors indicate that they rely on JC for resident education in biostatistics, but it may not be effective. Adjunct methods of teaching these skills are needed.

APPENDIX 1. PROGRAM DIRECTOR SURVEY

The Use of Journal Club in Surgical Residency Programs

1 Does your residency program have a journal club?
- ○ Yes
- ○ No

2 How frequently does your journal club meet?
- ○ Weekly
- ○ Bi-weekly
- ○ Monthly
- ○ Bi-monthly
- ○ Quarterly
- ○ Annually

3 When does your journal club meet?
- ○ During the evening
- ○ During the workday—protected educational time
- ○ During the workday—nonprotected timed

4 Is the time residents spend in journal club considered part of their logged duty hours?
- ○ Yes
- ○ No

5 Is there industry support for your journal club?
- ○ Yes
- ○ No

6 Approximately how many members of the faculty are present at journal club?

7 Approximately what percentage of the residents is in attendance at journal club?

8 How many papers are discussed at each journal club?
- ○ 1
- ○ 2
- ○ 3
- ○ 4
- ○ 5 or more

9 Who selects the papers to be discussed at journal club?

10 Who is the primary leader of the discussion of the papers at journal club?

11 What is/are the primary educational goal(s)/objective (s) of your journal club?

12 How is progress toward these goal(s)/objective(s) assessed?

13 Are these goal(s)/objective(s) being accomplished during your program's journal club?

14 Do residents in your program receive any formal or informal instruction in biostatistical methods or techniques?
- ○ Yes
- ○ No

15 [IF YES] What is the nature of this instruction?

16 How effective is journal club at educating residents in biostatistical methods and techniques?
- ○ Extremely effective
- ○ Very effective
- ○ Moderately effective
- ○ Slightly effective
- ○ Not effective at all

17 Have there been alterations made to your journal club after the implementation of the 80-hour work week?
- ○ Yes
- ○ No

18 [IF YES] What alterations were made?

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