How Well Are We Doing at Teaching Critical Appraisal Skills to Our Residents? A Needs Assessment of Plastic Surgery Journal Club

Quelle est la qualité de l'enseignement des compétences en évaluation critique aux résidents? Une évaluation des besoins d'un club de lecture en chirurgie plastique

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Abstract

Objective: To perform a needs assessment of journal club in plastic surgery residency programs. Specifically, this study focused on potential gaps in journal club associated with teaching and assessing critical appraisal of the literature, an important component of medical education and practice. **Methods:** This is a qualitative study that utilized an online survey tool to collect information about the characteristics of journal club in plastic surgery residency programs in both Canada and the United States. Both program directors and residents were surveyed. **Results:** When presented with a range of objectives, both program director and resident responses identified that teaching critical appraisal skills was often the main goal of journal club in their program (67.1%). Most trainees perceived that journal club was at least somewhat effective in improving their critical appraisal skills. Despite this perception, many residents felt that they had minimal to no experience in critical appraisal of the literature upon entry into their respective residency programs (46.2%), and only 29.2% indicated that they received formal instruction regarding critical appraisal. Three-quarters of residents indicated that there was no tool provided to aid them in their analysis of the literature. Finally, most residents also responded that they were not assessed objectively with regard to their performance. **Conclusions:** Although residents in our study perceive journal club to at least somewhat improve their critical appraisal skills, evidence in the literature has been controversial. It cannot be assumed that residents are learning the skills they need by simply attending and reading the articles associated with journal club. Future study should focus on the best way to meet these objectives.

Résumé

Objectif : Effectuer une évaluation des besoins des clubs de lecture dans les programmes de résidence en chirurgie plastique. La présente étude portait plus précisément sur les lacunes potentielles des clubs de lecture pour l'enseignement et l'évaluation critique des publications, un élément important de l'enseignement et de la pratique de la médecine. **Méthodologie :** La présente étude qualitative a fait appel à un sondage en ligne pour colliger de l'information sur les caractéristiques des clubs de lecture dans les programmes de résidence en chirurgie plastique, à la fois au Canada et aux États-Unis. Tant les directeurs de programme que les étudiants ont été sondés. **Résultats :** Lorsqu'on leur présentait une série d'objectifs, les directeurs de programme et les résidents répondaient que, souvent, les clubs de lecture étaient d'abord destinés à enseigner des compétences en évaluation

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critique (67,1 %). La plupart des étudiants trouvaient que les clubs de lecture étaient au moins quelque peu efficaces pour améliorer leurs compétences en évaluation critique. Malgré cette perception, de nombreux résidents trouvaient qu'ils avaient une expérience minimale, sinon inexistante, de l'évaluation critique des publications à leur arrivée en résidence (46,2 %), et seulement 29,2 % indiquaient avoir reçu une formation formelle en évaluation critique. Les trois quarts des résidents précisait qu'aucun outil ne leur était fourni pour les aider à analyser les publications. Enfin, la plupart ajoutaient que leur performance n'avait pas fait l'objet d'une évaluation objective. **Conclusions :** Même si les résidents à l'étude trouvaient que les clubs de lecture amélioraient au moins quelque peu leurs compétences en évaluation clinique, les preuves tirées des publications sont controversées. Il est impossible de présumer que les résidents acquièrent les compétences dont ils ont besoin simplement en assistant aux clubs de lecture et en lisant les articles exigés. De prochaines études devront porter sur le meilleur moyen de respecter ces objectifs.

Keywords

journal club, critical appraisal skills, evidence-based medicine, education

Background

Journal club is common in both surgical and medical residency programs around the world. In the mid-1800s, the biography of Sir James Paget noted the earliest reference to a group of medical professionals meeting to review recent literature to keep their practice up to date.¹ Sir William Osler is credited with coining the term "journal club" and bringing it to North America at McGill University, where he recorded the first meeting in 1875.²

Several studies have established that there are an array of journal club formats and characteristics throughout different specialties and programs.³⁻⁵ Beyond keeping abreast with the current literature, journal club has since evolved to accommodate a variety of goals in the medical profession. These include developing critical appraisal skills, facilitating evidence-based practice, and teaching medical statistics and research education, among others. These goals demonstrate an effort by the medical community to provide physicians with the knowledge they need to deliver the most appropriate and evidence-based care to their patients.³⁻⁶

Benefits to attending journal club include confidence in reading and increased motivation to read the literature.⁷ There is also some evidence that journal club encourages the development of knowledge regarding biostatistics and clinical epidemiology.⁸⁻¹¹ Studies have demonstrated the perception that journal club has directly impacted physician practice, although rigorous evaluation of the genuine impact on patient care has not been performed.^{7,8}

Several limitations of journal club have also been identified. Overall dissatisfaction with journal club has been conveyed in the literature.¹²⁻¹⁴ Journal club can be a very passive experience for learners and there is a lack of frequent contribution from trainees to the discussions that take place in journal club.^{7,15} More interactive meetings are suggested, but implementation of a more interactive structure must be balanced by the time commitment allocated for journal club and each club's major goals.¹⁶ Preparation for a meeting by pre-reading the articles under review has been a further concern, as well as dissatisfaction with the discussion component of meetings.¹⁵ Members may have issues with the clinical relevance of the papers chosen for discussion, the effectiveness of the discussion, and lack of focus on the most relevant parts of the

research. Complaints note that not enough time is spent on the importance of the clinical information that has been presented.^{12,17} Additionally, efforts to elucidate whether journal club is effective at teaching critical appraisal skills—an important goal throughout the literature on journal club—is unclear. This is largely because the majority of studies addressing improvement in critical appraisal skills are based on perception or pre- and post-test scores, rather than randomized control trials.⁸⁻¹¹ A recent randomized control trial reported significance in the difference between scores on a validated critical appraisal test of 2 styles of journal club, suggesting that perhaps some forms of journal club may be more effective at achieving increased critical appraisal abilities than others.¹⁸

Whether or not journal club effectively develops sufficient critical appraisal abilities in residents and physicians is an important issue, especially if these skills are not being taught or acquired elsewhere. The ability to critically appraise the literature will provide clinicians with one of the skills they need to make informed and scientifically sound decisions regarding their patient's care—a significant component of the ability to practice evidence-based medicine. Both the Royal College of Physicians and Surgeons of Canada and the Accreditation Council for Graduate Medical Education emphasize critical appraisal skills as a necessary constituent of a medical trainee's education and a physician's ability to practice medicine.^{19,20} New evidence, utilizing validated critical appraisal and competency assessments, suggests that journal club has the potential to improve critical appraisal skills with the right structure and tools.^{18,21}

Our objective was to perform a focused needs assessment of journal club in plastic surgery residency programs, gathering information about current practices, goals, and various characteristics of these meetings. Performing a needs assessment is necessary as there is a dearth of information on journal club in plastic surgery residency programs. A solitary study addressed the characteristics of a single journal club in plastic surgery, but information on a larger scale is lacking.¹⁷ Although there is literature regarding journal club in other specialties, it is difficult to draw conclusions due to the different needs of surgical specialties. To ensure the educational potential of journal club is being achieved, it is important to establish which qualities are critical to promote its success. These include regular

attendance, interactive contribution from all participants, distribution of articles in advance, utilizing a moderator for discussion, refreshments, limitation of the required work, and the use of a critical appraisal checklist, among others.^{3,4,10,22}

A needs assessment will help elucidate whether journal clubs are being utilized to teach critical appraisal skills to trainees and how the current practices of journal club affect the ability of such meetings to achieve desired goals. Clearly defining problems and needs enables a focused look at a curriculum's current issues.²³ Specifically, this study focused on methods used for critical appraisal of the literature, an important component of medical education and practice. A secondary objective of our research study was to establish whether the use of a critical appraisal tool was commonplace in plastic surgery journal club programs and whether a tool is felt to be beneficial for facilitating critical appraisal in a journal club setting.

Methodology

A conceptual framework, consisting of a 6-step model for medical curriculum development, provided structure for this study.²³ This study focused primarily on the first 2 of the following 6 steps:

1. Problem identification and general needs assessment
2. Targeted needs assessment
3. Goals and objectives
4. Educational strategies
5. Implementation
6. Evaluation and feedback

Problem Identification and General Needs Assessment

A review of the literature was performed to establish the efficacy of teaching critical appraisal skills in the journal club setting and whether a standardized tool for literature evaluation was currently commonplace. Primary articles were collected using MEDLINE (Ovid) and ScienceDirect databases. It was necessary to establish the current goals for journal club noted in the literature, whether those goals were being achieved, and whether there had been any previous problems with teaching critical appraisal skills identified within the journal club setting.

Targeted Needs Assessment

A targeted needs assessment was focused on the learners themselves. In particular, the learners were resident participants in plastic surgery journal clubs, with concentrated interest in how their learning and development as physicians is facilitated in this setting.

In order to address these first 2 steps of medical curriculum development, a survey was constructed to determine the different configurations and perceptions of journal club in plastic surgery across North America. A survey was sent to plastic

surgery residents in both Canada and the United States, and program directors of plastic surgery residency programs were also surveyed with relevant questions to provide comparison. The questionnaire was distributed via the UBC Survey Tool through the vendor Fluidsurveys™ by SurveyMonkey, San Mateo, California. Areas covered by the questions included format, goals, practices, perceived benefits, and satisfaction. Questions contained a mixture of multiple-choice, short-text response and simple Likert scales, where appropriate. Initial survey questions were designed to simplify data assessment and were based on questions from similar studies in other surgical and clinical specialties. Further questions were developed based on the objectives of this study, including a focus on teaching critical appraisal skills, which was predicted to be a common goal in journal clubs of plastic surgery based on literature and personal experience.^{17,24} Open-ended questioning was used at the end of the survey for further comments and suggestions.

Survey responses were analyzed using descriptive statistics. The results for the entire cohort were reported, along with the results of the 2 subgroups (residents and program directors), where applicable. Missing survey responses were omitted from the analysis.

Results

Response Rates

Sixteen of the 70 Canadian and American program directors in plastic surgery who were e-mailed the survey responded, yielding a program director response rate of 22.8%. The response rate among residents receiving the journal club survey was approximately 37.5% (30 respondents of 80).

Overview of Journal Clubs in Plastic Surgery Residency Programs

The majority of residents and program directors responded that a journal club session took place monthly (73.3% [N = 46]). Meetings are held in a number of places, often varying in location over the year for a given program, with the majority being hosted at a member's home (64.4%). Combined results from residents and program directors suggest that food is almost always provided (95.6%). Meetings most commonly take place during a weekday evening (93.3%), although some indicated that they meet in the morning (11.1%), and a small number of journal clubs vary in the time of day that the meetings are scheduled. The duration of journal club was most typically between 1 and 3 hours (90.7% of meetings; 2.10 hours on average [N = 43]). Cumulative responses indicate that residents and attending surgeons are usually present at every journal club (100.0%), but fellows (68.9%) and medical students (60.0%) occasionally attend journal clubs as well. Some respondents indicated that other people, such as community surgeons, industry representatives, and research team members, may also be in attendance. The facilitator of most journal

Table 1. Journal Club Goals, Tools, and Evaluation.

Specific Questions Posited	Overall (N = 46), %	Residents (n = 30), %	Program Directors (n = 16), %
What do you perceive to be the main goal of journal club?			
Keep abreast with the current literature	34.9	37.0	31.3
Teaching critical appraisal skills	32.5	25.9	43.8
Research education and research skill development	11.6	11.1	12.5
To impact clinical practice	7.0	11.1	0.0
Answer a clinical question	7.0	7.4	6.3
Develop camaraderie/ social relations	0.0	0.0	0.0
Other	7.0	7.4	6.3
Do you use a tool for critical appraisal in your program			
Yes	32.5	25	43.75
No	67.5	75	56.25
If you don't use a tool, do you think a tool for critical appraisal would be useful?			
Yes	77.8	72.2	88.9
No	22.2	27.8	11.1
If you are using a tool, do you find the tool useful?			
Not effective	0.00	0.00	0.00
Minimally effective	7.7	16.7	0.0
Moderately effective	46.2	33.3	57.1
Very effective	46.2	50.0	42.9
Is the performance of the residents assessed at journal club?			
Yes	30.0	12.5	56.2
No	70.0	87.5	43.8

club meetings is an attending surgeon (72.7% [N = 44]). The number of papers reviewed in each meeting ranged from 2 to more than 10, with papers most commonly being chosen based on a topic of interest (45.3%; [N = 41]). To prepare for journal club, various expectations include simply reading the proposed articles (14.6%), critiquing the articles (19.5%), and preparing presentations (46.3%; [N = 41]). In journal clubs across North America, attendance is typically mandatory for residents (95.5% [N = 44]) and sometimes mandatory for attending surgeons (32.6% [N = 43]).

Journal Club Goals, Tools, and Evaluation

The main goal of journal club was keeping abreast with the current literature for 34.9% of respondents and teaching critical appraisal skills for 32.5% of respondents. Responses between the residents and program directors varied, with the 2 most frequently identified main goals remaining the same between the 2 subgroups (Table 1). Respondents were also

Table 2. Residents: Journal Club Effectiveness and Critical Appraisal Training.

Specific Questions Posited	Residents' Responses, (n = 30)
Please rate your perception of each of the following effects of journal club in your program on a scale of 1-4 (1 = not at all, 2 = somewhat, 3 = moderately, 4 = significantly)	Mean (SD)
Improved my critical appraisal skills	2.8 (0.9)
Improved my knowledge of how to perform quality research	2.7 (0.9)
Keeps me up to date with relevant literature	3.1 (0.9)
Impacts the way I practice medicine	2.5 (0.8)
Improved my knowledge of statistics	2.2 (0.9)
Helps me develop camaraderie with attendings and residents	3.0 (1.1)
What experience do you have with critical appraisal prior to residency?	%
None or minimal experience	46.2
Moderate experience	42.3
Significant experience	11.5
Have you received formal training in critical appraisal of the literature in residency?	%
Yes	29.2
No	70.8

asked to rank the various goals of journal club according to what they perceived to be the most important, rather than the identified goal of the journal club they attend. The top 3 goals identified by program directors were teaching critical appraisal skills, keeping abreast with the current literature, and research education and skill development, with similar results from the residents, whose results indicated that keeping abreast with the current literature, answering clinical questions, and teaching critical appraisal skills were the most important, respectively.

Residents rated the effect of journal club on a 4-point Likert scale. The residents perceived journal club to be "somewhat" or "moderately" effective in improving their critical appraisal skills, knowledge, practice, and camaraderie (Table 2).

The residents participating in the survey had either "none or minimal experience" (46.2%) or "moderate experience" (42.3%) in critical appraisal upon beginning their residency (Table 2). In addition, the majority of residents reported not having received any formal training for critical appraisal of the literature (70.8%) and not having a tool for critical appraisal in their program (75%). Similarly, the majority of program directors didn't have a tool for critical appraisal in their program (56.25%). The study participants who did have a tool for critical appraisal in their program found it moderately or very effective (92.4%; Table 1).

According to the residents, their performance in journal club was not being assessed (87.5%), contrary to the responses from the program directors indicating the performance of the residents at journal club was being assessed (56.2%; Table 1).

Discussion

General Needs Assessment

There is a clear need and consensus in the medical field for physicians to actively ensure they are up to date in their field of medical practice.^{8,10,25} Evidence-based medical knowledge relies on reinforcement of information and continued learning. It is known that knowledge learned during training deteriorates over time, unless some form of reinforcement is present.^{26,27} Professionals in a health-care setting have previously identified that there are gaps in their medical knowledge.^{28,29} In order to practice evidence-based medicine, physicians must be capable of determining whether the evidence itself is sound. One of the tasks that clinicians must be able to perform is critical appraisal of the literature for its applicability and rigor.³⁰ The ability to practice evidence-based medicine will be affected if physicians do not possess the means to assess the literature in a way that is reflective of its true value and clinical applicability. The importance of teaching critical appraisal skills and keeping abreast with the current literature was reflected in the survey results of this study, where about two-thirds of residents and program directors identified developing these skills as the main goals of their journal club program. Residents responding to our survey largely felt that journal club did improve their critical appraisal skills to some degree (91.7% reported at least some improvement).

Targeted Needs Assessment

One strategy indicated in many medical specialties for aiding physicians in maintaining evidence-based practice has been to review articles in a journal club meeting, especially within the setting of a residency program. There is a clear obligation described in the CanMEDS competencies for a medical trainee to establish the capabilities of a “scholar” at the completion of their education in order to facilitate evidence-based practice.¹⁹ One of the enabling competencies suggested that demonstrating the qualities of a scholar includes the ability to “critically evaluate the integrity, reliability, and applicability of health-related research and literature.”¹⁹ Similar requirements are echoed by the American Medical Accreditation body regarding the competency of “practice-based learning and improvement.”²⁰ Our results suggest many plastic surgery residents entering their respective programs may not have significant experience in critical appraisal of the literature. A total of 46.2% of resident respondents indicated that they have minimal to no experience in structured article review. Unless remedied during residency, this lack of experience in critical appraisal may impact the learner’s ability to extract pertinent evidence-based information from the literature once they have completed their training. For those residents who felt they had sufficient experience in critical appraisal, our results raise questions regarding what it means to have significant experience and how residents feel they have acquired these skills in the first place, whether through research or formal instruction at the medical student level.

Several deficiencies within the journal club setting were identified for facilitating the acquisition of critical skills for appraisal. The surveyed residents were questioned about whether they received any formal training regarding critical appraisal of the literature, and most indicated that they did not (70.8%). The majority of trainee respondents also specified that there was no critical appraisal tool to guide them in the review process. These results imply that many residents in plastic surgery residency programs may have minimal instruction on the techniques of critical appraisal. Without training or an educational tool, it cannot be assumed that residents are acquiring the skills they need on their own, by simply attending and reading the articles associated with journal club. Although the resident respondents perceived that there was some positive impact of journal club on their ability to review articles, previous literature regarding whether journal club improves critical appraisal skills has frequently been inconclusive.⁸⁻¹¹ However, recent evidence suggests that improvements in these skills can be achieved in the setting of a structured journal club curriculum, alongside the use of a critical appraisal instrument and committed faculty.²¹ Another possible concern identified by surveying plastic surgery residents was that most indicated they are not assessed in some way with regard to their performance in journal club. This could suggest that trainees may not have the means to gauge whether they are gathering the most appropriate and important information from the articles they are analyzing or whether they are properly recognizing which evidence is both clinically relevant and scientifically sound. Feedback for residents has been recommended in the literature to improve the educational value of journal club, especially when the goal of the journal club is to teach the skill of critical appraisal in a particular program.³

Future Directions: Goals, Objectives, and Educational Strategies

Evidently, there is a need to ensure that critical appraisal is a firmly established component of a trainee’s skill set, not only in residency but also beginning in medical school, so that learners have at least some ability to appraise literature when they begin practicing medicine. In the residency setting, there is potential for structured journal club sessions to achieve this goal.²¹ Future areas of research should explore critical appraisal teaching practices at the medical student level, liaising with the university to establish a curriculum for effectively teaching these skills at both the medical student and resident level. In keeping with stepwise medical curriculum development practices, our results indicate that a standardized critical appraisal tool developed specifically for literature review in journal club would be well received by participants as an educational strategy for teaching critical appraisal skills.²³ Utilizing an instructive tool such as this would provide residents with an organized approach to article analysis. Several reports and organizations such as the EQUATOR Network advocate for the use of a stepwise approach to critical appraisal in the setting of health research.^{3,21,31-33} Use of a critical appraisal tool must be

carefully deliberated, considering the significant number of critical appraisal tools that lack rigor and have not been reliably tested.³⁴ Organizing an appropriate means of critical appraisal skill assessment would be a necessary component of completing curriculum development in this area.²³ We would suggest that an appraisal tool that could be completed by residents may not only serve as an aid for article analysis but also as a resource for feedback and assessment. In the future, after development of such a tool, it could be used to construct a randomized control trial, which has been deemed necessary to definitively elucidate what format of journal club effectively imparts sufficient critical appraisal skills in residents over time.¹⁰ Moving forward, we would like to validate a critical appraisal tool that is appropriately detailed for the journal club setting, providing organization to article review and journal club discussions.

Limitations

Our study has several limitations. The survey technique itself has restrictions in the depth of information that could be collected, given that mostly multiple-choice questions and Likert scales were used rather than open-ended questions. We also had a low response rate of only 30.7% in total and preferably would have reached a response rate exceeding 50.0%; however, given that this is a needs assessment, the responses that were received were felt to be useful for future direction and potential curriculum design. Additionally, the study surveyed both US and Canadian plastic surgery residency programs, casting a broad net for data collection, which would not account for differences in journal club practices between the 2 countries. Most resident responses (70.0%) were from Canadian plastic surgery programs biasing resident answers to reflect Canadian residency journal clubs, while most of the program director responses were from American (75.0%). Our study is further limited by only including residents and program directors, though information from the other staff physicians attending journal club at each institution may have provided more comprehensive data. There is also the potential for response bias to affect the results, where residents who are unhappy with journal club may be more likely to respond to the survey, with the possibility that their dissatisfaction related to poor organization and effectiveness.

Conclusion

Clearly, teaching critical appraisal skills during residency is an important aspect of a physician's education, due to the implications that these skills have on practicing evidence-based medicine. Our project has identified several obstacles with regard to a residency program's ability to teach these skills. These obstacles include a lack of experience or foundation in critical appraisal upon entering residency, a deficiency of formal teaching on the topic of critical appraisal as a platform for further learning, the absence of a tool provided to guide inexperienced individuals in analysis of the literature,

and scarcity of feedback with which residents can understand their capabilities.

Currently, a succinct standardized tool to assess critical appraisal skills and the impact of these skills on practice is lacking.¹⁰ Without appropriate instruments to measure the effectiveness of a critical appraisal teaching intervention, it is difficult to infer the true value of the intervention.³⁵ We believe the use of a standardized literature critical appraisal tool would provide structure to journal club to assist in teaching their requisite skill set, while also offering the opportunity to provide assessment of improvement of these skills.

Authors' Note

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