A pilot investigation of a pediatric surgery journal club

William Shihao Lao a, Pramod Puligandla b, Robert Baird b,⁎

a McGill University, Montreal Quebec, Canada
b Department of Pediatric General and Thoracic Surgery, The Montreal Children's Hospital, McGill University, Montreal Quebec Canada

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Background: The CanMEDS competency “scholar” encompasses the creation, dissemination, application, and translation of medical knowledge. We hypothesize that a structured journal club (JC) for pediatric surgical trainees would meet these objectives in an enjoyable and long-lasting manner.

Methods: A JC involving two pediatric surgery training programs was created with each session focusing on a specific study design. Pre-tests/post-tests were administered before/after each session with durability of learning assessed during the following session. Metrics analyzed included participant satisfaction and an appraisal of evidence-based medicine (EBM) principals. Test results were analyzed using the paired T-test with p < 0.05 considered significant.

Results: On average, 14 participants attended each session, with all trainees present (4). While participants believed they understood EBM principles, 40% were unfamiliar with question formulation, 48% were unfamiliar with critical appraisal tools, and 60% had not appraised an article within the previous year. Pre-test to post-test comparison yielded an improvement in mean score (20 = perfect score): 10.8 to 16.9, p < 0.01. Measures of participant satisfaction were uniformly positive.

Conclusion: A structured Pediatric Surgery Journal Club addresses scholarly training objectives in a highly satisfactory manner and yields durable learning. A web-based curriculum based on this model could serve as an important educational tool for trainees and attending staff alike.

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Participants agreed that EBM was a valuable tool worth learning (mean 4.7 ± 0.47), with 80% of responders stating that they used evidence-based principles in practice (mean 4.0 ± 0.63). In addition, 75% of participants also believed they were familiar with the principles of EBM (mean 3.9 ± 0.70). However, in later statements querying each participant’s familiarity with said principles, up to 40% stated they were unfamiliar with standard question formulation (mean 3.4 ± 1.6), 50% were unfamiliar with critical appraisal tools (mean 3.5 ± 0.85), and 60% were unfamiliar with methods of acquiring the best evidence (mean 3.3 ± 1.1). Lastly, 60% of participants had not critically appraised an article within the previous year.

In total, 9 of the attendees returned the pre-session test and 5 attendees returned the initial post-session test (Fig. 2). A comparison of pre-session and (early) post-session test scores revealed a significant improvement with the mean score increasing from 11.1 ± 5.7 to 16.2 ± 4.9 (max = 20; p = 0.05). Five participants returned the second (late) post-session test at the subsequent session. The mean score of this assessment of learning durability was 16.8 ± 3.6 (p = 0.03) compared to the original scores.

Overall, all respondents (n = 9) were satisfied with the journal club (mean 4.4 ± 0.52), and found the articles to be clinically relevant (mean 4.0 ± 0.5) in addition to being well summarized and useful (mean 4.2 ± 0.44). Moreover, the methodological review was perceived by all to be both relevant (mean 4.4 ± 0.53) and helpful (4.6 ± 0.53). These results are summarized in Fig. 3.

3. Discussion

It has been well demonstrated that one of the main barriers to evidence-based practice in pediatric surgery is the lack of high level studies to inform clinical decision-making [4,12,13]. Even when a well-conducted trial is performed, recognized hurdles inhibit practice change by impeding the dissemination, acceptance and application of that evidence. The results of this study suggest an additional fundamental barrier to evidence-based practice: the lack of knowledge of key EBM concepts. Addressing this problem is of utmost importance as a proper understanding of EBM not only aids in the critical appraisal of existing literature, but also allows for more thoughtful study design, in turn, ensuring the creation of more robust evidence. Ultimately, it is the generation of new knowledge that will drive the profession forward; graduating trainees must be equipped with the necessary tools to accomplish this.
This study indicates that a structured JC was effective in disseminating EBM principles as it employed many of the critical characteristics of successful journal clubs [9]. These include regular and anticipated meetings, mandatory attendance for trainees, clear long- and short-term objectives, appropriate meeting times and incentives, a trained journal club leader for choosing papers and leading discussions, using established critical appraisal processes, and summarizing journal club findings [14]. In addition, using the internet to circulate the papers and resources prior to the meeting allowed participants to easily access resources outside of sessions. In fact, one of the possible future milestones for the journal club is the creation of an online resource/database to supplement the current format [15,16]. For the time being, the ‘in person’ nature of the session ensured an engaged learning environment for all attendees.

Several aspects of the JC were extremely positive. Fig. 1 demonstrated wide variability in learner self-assessment, which was also true specifically for the 4 members of the target audience. All respondents either agreed or strongly agreed with the statement that EB principles have value and are worth learning. While many participants believed they understood the methods of EBM, both the initial self-assessment and pre-session test demonstrated that this was not the case. In fact, a large portion of the participants did not comprehend the methodologies used for formulating questions, acquiring evidence, or appraising literature. A mean score below 60% on the pre-session test further confirmed the finding. This discordance between the self-assigned familiarity and actual knowledge suggests the false perception that the core concepts of EBM are self-evident and do not require formal teaching. However, a significant improvement in the post-session scores illustrated that this unperceived learning need is well addressed by the JC as presented here.

Several important limitations exist in the current journal club format. Despite all efforts to appeal to potential participants, incomplete attendance remains problematic. For example, not all staff surgeons from both institutions were able to attend the sessions, reducing their overall educational value and undermining the implied importance of the QPSJC to trainees in attendance. Furthermore, the small number of attendees at each session undermined the power of the present study, especially given that some of the participants did not complete the questionnaires or the tests. As the community of pediatric surgery in Montreal is fairly small in size, there is only a certain limit to which the power of this study can be increased. Moreover, the small sample size may also limit the external validity of our findings. Nonetheless, considerable variability likely exists in the background understanding of EBM concepts among practicing pediatric surgeons; a standardized EBM teaching curriculum addresses this variability by ensuring that core concepts are emphasized using examples derived from the field of pediatric surgery.

In general, this pilot study is further limited by its small dataset. The fact that only 9 out of 14 (about 65%) participants completed the test raises the possibility that the results may not be completely representative of the group. As an even smaller number of participants (5) completed the post-session test, the validity of the increase in score is significantly undermined. Further compounding the problem is the anonymous way under which the tests were administered. With the research methodology as constructed, there was no way of determining whether the 5 participants who completed the post-session tests had done a pre-session test at all. One of the ways to address this problem in future sessions is to make all questionnaires mandatory and to ensure that all have been properly filled prior to starting a session, and after its end.

In addition, as the journal club is held every three–four months, the elapsed time between each session may allow for significant “knowledge decay” over time. The full extent of such decay may only be confirmed or rejected once knowledge retention is assessed at future sessions. In fact, most successful journal clubs suggest meeting more than 3–4 times per year [14]. Another problem facing this study...
is the fact that the tools used for participant self-assessment and knowledge retention has not been validated. While examples of evaluative tools exist for evidence-based principles in surgery, these tend to address knowledge of EBM as a whole and do not sufficiently address the focus of specific sessions or this activity as a whole [17,18].

Our preliminary results indicate that a well structured, evidence-based Pediatric Surgery Journal Club is an appropriate educational method for addressing scholarly training objectives. Despite the small sample size, this study identified a significant “gap” between the perceived understanding of EBM principles by participants and objective findings based on a session pre-test. This was remedied through the current activity, as participants were able to achieve high-yield, durable learning in an appealing and organized fashion. As a future development, a web-based curriculum modeled after the current methods may serve as an easily-accessible educational tool for trainees and attending staff throughout North America.

References