


Learning Outcomes of Virtual Journal Clubs in Comparison to Real Ones in Pediatric Neurology Fellows

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ABSTRACT

Objectives: Journal Club sessions are a staple in clinical training, widely implemented across various specialties. This study aims to compare the effectiveness of in-person and virtual Journal Club sessions.

Materials & Methods: This comparative study involved pediatric neurology residents from two institutions: six residents from Children's Medical Center attended in-person sessions, while seven residents from Mofid Children's Hospital participated in virtual sessions. Evaluations were based on an interaction and behavior checklist during the sessions, a post-test consisting of ten multiple-choice questions, and a student-satisfaction questionnaire.

Results: A total of 13 pediatric neurology residents (12 women and 1 man) participated. The average knowledge score was higher in virtual sessions compared to the in-person sessions, though this difference was not statistically significant. High satisfaction (score of 4) for active participation was reported by 50% of in-person attendees and 57.1% of virtual attendees, with no significant difference. For analytic assessment of statistical tests in articles, high satisfaction was reported by 83.3% of in-person attendees and 100% of virtual attendees, also not significantly different.

Conclusion: The findings suggest that virtual Journal Clubs can be effective and satisfactory as in-person sessions. Further studies with larger sample sizes are recommended to validate these results.

Keywords:

Virtual
In-person
Journal Club
Pediatric neurology
Clinical evaluation

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Introduction

Journal clubs are sessions in which a group of physicians regularly meets to discuss articles of interest in current medical journals (1). Because journal clubs are one of the few examples of traditional medical education with peer-to-peer teaching, methods of increasing informality can potentially stimulate interaction. Leaving the hospital campus may be

normal to reduce attention to the educational hierarchy. These include hosting the event outside the hospital campus and providing food and drinks. This feature was present in the first journal club held outside St. Bartholomew's Hospital. Recent work suggests that this informality adds to the acceptance of the journal club itself (2).

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In recent decades, particularly in recent years, virtual journal clubs have become popular. Some factors contributed to the journal club's transition from in-person sessions to virtual ones. First, the conversational nature of journal clubs fits well with emerging virtual platforms such as Twitter, designed to facilitate rapid, real-time conversation between learners. Second, online tools allow learners from different locations to participate in a virtual roundtable discussion. Third, virtual journal clubs allow a variety of clinicians and content experts to participate. Fourth, a virtual format provides more flexibility in event planning (4). These virtual formats have gained popularity, specifically after the COVID-19 pandemic, as a special necessity (4-8). Even today, active journal clubs on social platforms such as Twitter have gained considerable popularity.

Twitter serves as an open online publishing platform where users can share text, images, and links through 140-character posts. These posts are

then made available to anyone who decides to "follow" the user. The inaugural journal club to utilize Twitter as its main form of interaction took place in 2011, initiated by Drs. Natalie Silvey and Fi Douglas, known as The Twitter Journal Club (9), an internal medicine journal club, set several precedents for future Twitter journal clubs. Prior to the club, the organizers shared a summary of the article on a dedicated website. To join the conversation, participants had to use the hashtag #TwitJC in their tweets. By searching for the hashtag, participants could see everyone's comments on the discussion, even if they did not follow that person. This hashtag system had been used for discussions on other topics before. The Twitter Journal Club simply utilized an existing feature on a social network to create a virtual version of a face-to-face journal club. After the discussion, the organizers posted a summary of the conversation on the club's website (10).

Table 1: Results of a survey of study participants in journal clubs by Likert scale

Question	1 (strongly disagree)	2 (disagree)	3 (neither agree nor disagree)	4 (agree)	5 (strongly agree)
I paid attention to the topics presented in the journal club.	0	0	2(15.4)	3(23.1)	8(61.5)
I had enough time to comment during the sessions.	0	0	1(7.7)	2(15.4)	10(76.9)
I had enough time to comment after the sessions.	0	0	2(15.4)	3(23.1)	8(61.5)
I am satisfied with my abilities to recognize and find articles related to my questions and problems.	0	0	3(23.1)	10(76.9)	0
I am satisfied with my skills for critical appraisal of articles.	0	0	5(38.5)	8(61.5)	0
I am satisfied with my abilities to analyze research methods and statistical information of articles.	0	0	10(76.9)	3(23.1)	0
I am satisfied with my abilities to synthesize the results of the studies.	0	0	4(30.8)	9(69.2)	0
I am satisfied with my abilities to use the articles for my daily practice.	0	0	4(30.8)	8(61.5)	1(7.7)
I am satisfied with my critical thinking skills.	0	1(7.7)	7(53.8)	5(38.5)	0
I am satisfied with my abilities to work independently of others to achieve clinically applicable results.	0	0	6(46.2)	6(46.2)	1(7.7)
I am satisfied with my ability of listening comprehension in journal clubs.	0	0	1(7.7)	11(84.6)	1(7.7)
I was satisfied with the way Journal Club was held.	0	0	1(7.7)	9(69.2)	3(23.1)

Materials & Methods

This study was conducted to compare the educational outcomes of two traditional face-to-face and virtual journal clubs. Pediatric neurology residents were divided into two groups of six (in-person) and seven (virtual). To ensure the purity of the comparison between the two similar but unrelated groups, this study selected the virtual group from one hospital and the face-to-face group from another, located in different geographical areas of the megacity of Tehran, Iran.

Then, journal clubs were set up in both face-to-face and virtual formats in the two groups, and the

educational outcomes were measured and compared based on post-tests and an observational evaluation sheet. The educational outcomes focus on enhancing learners' understanding of the subject matter, boosting their engagement in article discussions, and ensuring the target group effectively receives critical evaluations in the journal club. Additionally, these outcomes aim to assess the practicality of applying study results in students' daily practices and improve their ability to analyze the article's statistical tests. This intervention was evaluated with the following three evaluation tools during and after the implementation of journal clubs in two in-person

and virtual interventions. These sessions were held in each group over a three-month period, with each group having three sessions, and the same article was presented in each session. Therefore, six journal club sessions were held in two groups.

At the beginning and before the start of the study, a written consent form was obtained from the participants, and general explanations about the evaluation tool were provided to the participants.

The evaluation utilized the following tools:

- An evaluation checklist to assess resident interactions and behaviors during each journal club session, completed by two faculty members.
- A post-test consisting of ten multiple-choice questions, answered by two groups of participants after the journal club.
- A satisfaction survey was completed by residents following the journal club implementation.

Results

Thirteen pediatric neurology residents, including 12 women and one man, were included in the study. Although the average post-test score for the knowledge component was higher in the virtual journal club sessions compared to the in-person sessions, this difference was not statistically significant.

The satisfaction survey results revealed that:

- 50% of residents in face-to-face sessions and 57.1% in virtual sessions rated their satisfaction with receiving active critiques as a 4 (high satisfaction), a difference that was not statistically significant.
- 83.3% of residents in face-to-face sessions and 100% in virtual sessions rated their satisfaction with the analytic skill component of the statistical tests of the article results as 4 (high satisfaction), again, not statistically significant.

Table 1 presents the survey results of the study, participants in journal clubs, using a Likert scale.

Discussion

In a study by Belfi L, et al., in 2021, a standard format applicable to all virtual journal club sessions was developed to ensure repeatability from the presenter. An informal evaluation of the strengths of each session and areas for improvement was done. Thirty sessions were held before submitting the articles, including discussions on 36 articles. All participants very much accepted virtual journal clubs. Medical students and residents found this information new and interesting. Participants stated that the journal clubs enhanced their knowledge, communication, and teaching skills. The format of these sessions provided an ideal environment for training medical students and

residents (11). In the present study, 92.3% of the participants were satisfied and very satisfied with holding the journal clubs. The participation rate based on the average number of questions asked in eight subject areas related to the articles was slightly higher in the face-to-face session. However, this difference was not statistically significant.

In 2023, Ali Shah et al. conducted 12 virtual journal clubs on different topics. Orthopaedic residents from all over Pakistan participated in the virtual journal club on the Zoom platform. The residents provided feedback on various aspects of their learning experiences by answering 11 questions using a 5-point Likert scale. The feedback was analyzed to assess the effectiveness of the virtual journal club. The virtual Journal club proved to be a highly convenient, effective, and valuable form of distance learning. It led to improvements in the knowledge, attitude, and skills of the residents, which in turn supported their delivery of patient care and improved patient clinical outcomes (12). In this study, although the average post-test score for the knowledge component was higher in the virtual journal club sessions compared to the in-person sessions, this difference was not statistically significant. 100% in virtual sessions rated their satisfaction with the analytic skill component of the statistical tests of the article results as 4 (high satisfaction).

In-person journal clubs have limitations due to the challenges of scheduling participants, facilitators, and space limitations; however, there is still no gold standard for measuring the success, quality, and effectiveness of virtual journal clubs. Web traffic analysis and data analytics provide a means of measuring the “success” of a journal club, with the assumption that larger numbers equate to greater success and impact (13).

Keys to the success of the journal club include paying attention to who the learners are and what they want to learn—ensuring that learning is social and collaborative and not hindered by hierarchical boundaries. Combining key elements of the classic journal club format with new teaching approaches to meet the needs of contemporary learners, using the advantages of digital connection (14).

The online environment brings challenges and opportunities. The skills learned in journal clubs remain highly relevant in contexts where critical evaluation is present. Information is rapidly generated, and the application of evidence is critical to patient care. It is necessary to be creative and flexible to ensure that learners’ needs are met, and efforts should be made to involve those who may not naturally be drawn to online environments (15).

In Conclusion

The findings suggest that virtual journal clubs can be as effective and satisfactory as in-person sessions. One of the limitations of this study was the small sample size. It is recommended to conduct a wider study with a larger sample size to compare the effect of holding a journal club in-person and virtual. If the virtual method of holding a journal club proves effective, incorporating it into the educational program for medical students and residents can enhance learners' knowledge and analytical skills regarding articles.

Authors' Contributions

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Mahmoud Mohammadi: Designing the research, Reza Shervin Badv, Elham Pourbakhtyaran: Writing the draft, Mohsen Javadzadeh, Zahra Rezaei, Mahmoudreza Ashrafi, Gholamreza Zamani, Morteza Heidari: Editing the article, Mahmoud Mohammadi, Elham Pourbakhtyaran: Supervising and final revision.

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Conflicts of Interest

There were no conflicts of interest.

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