

Research Article

Increasing Access to Surgical Education during the COVID Pandemic: Implementation and Outcomes of a Pilot Online Weekend Journal Club in Paediatric Orthopaedics

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Abstract

Background: The recent COVID-19 pandemic has disrupted all aspects of healthcare. The negative impact on medical education and training is often underemphasized. The need for up-to-date knowledge and isolation during lockdowns has led to numerous online learning forums. Existing forums lack interaction and do not follow adult learning principles. We describe the development and outcomes of a pilot international online Journal Club (JC).

Methods: The Weekend JC was led from an academic referral centre and targeted former fellows practicing in remote and rural locations. The structure was two one-hour online Zoom sessions every week during which relevant recent paediatric orthopaedic publications were discussed. The Kirkpatrick model was used to evaluate impact.

Results: Thirteen sessions were completed with 60 articles reviewed in three and half months. The number of participants increased from 3 to 11, and increased engagement and camaraderie were also noted. The Weekend JC showed a positive response in the Kirkpatrick levels 1 and 2 (reaction and learning). Electricity and internet blackouts in some locations were the main hindrance to the smooth running of these meetings.

Conclusion: The pilot Weekend JC was a successful initiative in adult learning. It requires no funding, and has the scope to nurture international collaborations, to overcome limited access to interactive learning forums for rural and remote providers, and to create a broader community of practice with educational and holistic benefits.

Keywords: Weekend JC; Journal clubs; Medical education; COVID-19 education; Adult learning

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Introduction

In recent years, there has been a seismic shift in the cause of death in children. A substantial decrease in infectious diseases and a rise in non-communicable diseases, many of which are amenable to surgical care, has been the trend. Despite this, children's surgical care remains underappreciated in global health today [1].

The barriers to providing adequate surgical care in Low- and Middle-Income (LMIC) countries include lack of workforce development, shortage of equipment and resources, lack of access, and constant brain drain of trained specialists. Lack of speciality hands-on training, limited availability, and expense of educational material at the point of care, and lack of a mentorship are also significant deficiencies [1]. The impact of the recent COVID 19 pandemic on healthcare availability and delivery has been well

highlighted; however, its negative impact on medical education is often overlooked. Many online resources such as online webinars, CME, and case discussion platforms with remote audiences have arisen to address this deficiency. Though invaluable during the pandemic, these sessions have had several shortcomings when considering adult learning principles. Most importantly, some have lacked participant engagement, resulting in distracted attendees. In addition, many of these new forums have lacked objective evaluation measures [2]. In some of the forums, the participants have no task to perform, and their inability to share and relate their experiences significantly impacts the assimilation of new knowledge [3].

When practising in remote locales, children's surgical specialists often lack access to regular small group academic activities, speciality specific journals, and the peer interaction necessary to keep them up-to-date in their highly specialised areas. They also lack motivation for research activity and publishing their experiences. Webinars and online courses do not always address the felt needs of rural and remote surgeons and do not allow them to select the topic of interest for learning.

A journal club allows participants to do self-reading, teaching, and interacting, and discussions that involve sharing of experiences. As it is carried out in small groups, the journal club activity provides peer recognition, mentoring, acquiring new knowledge, and developing the ability to evaluate new knowledge critically. It also provides exposure to new learning tools such as statistics, evaluation and writing of research reports, and planning studies.

The remotely placed Paediatric Orthopaedic surgeons identified a need for our academic institution, where many of them had trained, to develop a customised weekend Journal Club (Weekend JC) hosted on the free video communication platform, Zoom (Zoom Video Communications Inc San Jose, California). We describe the methods in piloting this journal club and share early results and lessons learned.

Methods

The group was initially organized through an academic institution and its surgeon to provide ongoing academic support to former fellows from LMIC and remote areas. The membership was limited to those who did not have access to academic journal clubs locally. The organisers were one institutional fellow and one external specialist. The maximum participation was intended to be 12 to 15 surgeons. For homogeneity, all had worked for at least one year in a specialist department during their training. One-hour sessions were planned and usually lasted two free online Zoom sessions, sometimes exceeding the allotted time. The Zoom platform was chosen for the length of free sessions that were renewable and familiar to most participants with this platform.

One academic institution fellow and one surgeon from the group searched the most recent Paediatric Orthopaedic and Orthopaedic journals, and a list of 4 to 8 articles for discussion was prepared and circulated a few days in advance. The orthopaedic consultant outside the institution searched the open access journals, and the institutional fellow searched the subscription journals. In addition, all participating surgeons were encouraged to find articles of their interest and present them in the journal club. If they did not volunteer to read an article of their choice, they were allocated the lead consultant's selected article. Articles were, with some exceptions, selected from the most recent journals. The exceptions were made when any of the participants wished to bring a particular publication for discussion relevant to

their or group's practice.

The activity termed the 'Weekend JC' was held on Saturdays in the late afternoon. It involves participants from four nationalities, all without access to specialist journals access and journal clubs. Saturday afternoon was selected after discussion, as most surgeons finished their clinical responsibilities and could make them available unless they were on call. Anyone with internet access sufficient for an audio call could technically join this virtual journal club. No cancellations of meetings were allowed as those available could carry out the activity even if few discussants could not attend due to personal or professional commitment. As all members were allocated a journal once they had finished, there were always 7 to 8 potential discussants in each journal club session.

The selected publications were emailed to all participating surgeons to review and one lead presenter and discussant allocated for each article. The entire group read all articles. At the time of the discussion, the journals were kept open on their computers/laptops/smartphones by all so that any reference to figures and tables could be carried out directly without a need for power points or screen sharing. The video presentations were deliberately avoided to limit the need for higher bandwidth/internet data consumption. The lead discussant presented the paper's findings and provided a commentary and his/her interpretation in 10 minutes. They then opened the paper for discussion. After completing clarifications and comments, the participants as a group decided whether the findings justified the conclusion and applicable to their practice. It sometimes led to discussions on how the surgeons managed this condition in their setting and if they will make changes to their practice and protocols. On rare occasions when the participants strongly felt otherwise, it led to a letter to the editor. When some unfamiliar statistics were used in the publication, a small invited explanation from a bio-statistician was considered helpful. A brief survey of 11 questions was done to evaluate Kirkpatrick level of the educational activity [4] (Table 1).

Table 1: Kirkpatrick assessment for Weekend JC.

Kirkpatrick level	
1 - Reaction	Do you feel that Weekend JC is worthwhile?
	Do you think Weekend JC was successful?
	What was your level of interest and engagement in Weekend JC?
	Has your interest level changed since the first time you first attended it?
2 - Learning	Did you acquire the intended knowledge?
	Did the Weekend JC change your understanding of certain topics?
3 - Behavior (Not assessed)	Do you intend to change or have changed your practice according to knowledge gained in the Weekend JC discussion?
4 - Results (Not assessed)	Did your patient outcomes improve?

Results

From its inception in December 2020, the forum saw its members return regularly for the weekly meetings. Amongst the changes observed, the increase in the number of participants from three to eleven (Figure 1). And improvement in the quality of the lead discussants' presentation, were the most obvious. On any one day, at least 5 to 6 members attended the journal club. During these months, sixty articles were reviewed, and one letter to the editor was written and accepted for publication. The articles reviewed covered all topics important in paediatric orthopaedics including congenital disorders,

infection and trauma (Figure 2).

The Weekend JC's subjective outcomes were assessed by a small questionnaire based on the Kirkpatrick evaluation model [4,5]. This model, first devised by Donald Kirkpatrick in 1959, is a popular model for evaluating the effectiveness of a training program. It evaluates a program on four different levels, viz. reaction, learning, behaviour and results. All the weekend JC participants attended at least 50% of the discussions (mean=74%), limited mainly by being on call for younger individuals, with the senior-most participants attending all the discussions and the junior-most fellow attending the least. All the participants found the articles selected relevant to them in their daily practice. The request for basic science articles was meagre (25%) (Table 3). The Weekend JC showed a positive response in Kirkpatrick levels 1 and 2, viz., reaction and learning. This indicated that the participants found the exercise of the weekend JC interesting and felt that their knowledge regarding the subject was better than the start of the exercise. Given the short duration since its institution, Kirkpatrick levels 3 and 4, viz., behaviour and results could not be assessed. However, all the participants insisted that they would apply knowledge gained from the discussions in their practice.

An improved camaraderie occurred with passage of time. This was evident by consultations on clinical problems which were brought to the chat, and guidance in asking for available resources from NGOs. During one of the journal clubs, it was discovered that one of the remote hospitals had a wealth of clinical material relating to one specific neglected congenital disease. This led to plans for further research and publication on this topic (Table 2).

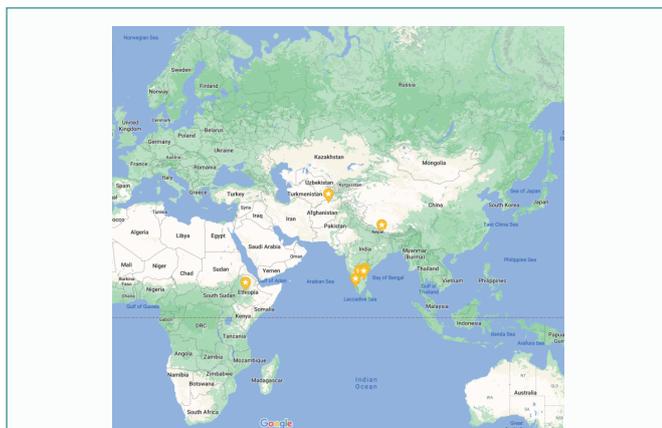


Figure 1: Locations of the participants in the Weekend JC.

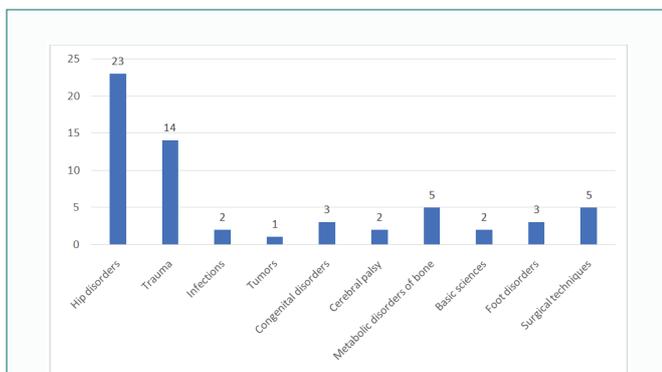


Figure 2: Subject breakdown of topics discussed.

Table 2: Survey responses by 7 respondents.

Attendance	>90 %	2
	80%-90%	2
	70%-80%	3
Found the Weekend JC successful		100%
Increased interest since the start		100%
Relevance of articles	>90%	3
	70%-80%	4
Change in understanding of subjects		100%
Other benefits recorded on survey		1. Improved camaraderie.
		2. Access to articles.
		3. Interaction and inputs by a senior surgeon.
		4. Chance to improve presentation skills.
		5. Ability to analyse scientific articles.
Suggestions		1. Flexibility of timing.
		2. Inclusion of articles from LMIC countries.
		3. Inclusion of basic science articles.

Table 3: Clinical, educational topics, networking opportunities and social exchanges in chat groups.

Clinical	Case discussions	1. High riding DDH.
		2. Post op outcomes of DDH.
		3. Fibrous Dysplasia management with bisphosphonates.
		4. Osteofibrous dysplasia.
		5. Multiple epiphyseal dysplasia.
		6. Congenital pseudoarthrosis of tibia.
		7. Mesomelic dysplasia
		8. Diagnostic difficulties in adolescent hips
		9. Brucella septic arthritis.
		10. Arthrogyrosis multiplex congenita with hip dislocation.
		11. Metabolic bone disease.
		12. Perthes disease sequelae with coxa breva.
		13. Radial hemimelia.
		14. Early slip in Slipped capital femoral epiphysis
Educational	Technical tips	1. Surgical technique description for treatment of segmental bone defect with external fixation and grafting.
		2. Management of non-union ulna with radial head dislocation.
Educational		1. Data for application for RCS provider's course.
		2. Exchange of information on CTEV program in Ethiopia.
		3. Exchange of information on study on septic arthritis.
Networking opportunities		1. Funding opportunities from United Surgeons for Children (USFC).
		2. Information regarding joining GICS.
		3. Planning a study for neglected DDH.
Social		Exchange of information on mountaineering trip

Challenges included electrical and internet blackouts for some participants; frequently exceeding the free time slots, that was overcome by renewing the Zoom connection on the same settings, inability to attend during emergency surgeries and rarely planned social activity. The quality of the Zoom connection for voice calls was good.

Discussion

William Osler is credited with creating the modern journal club at McGill University in Montreal in 1875 [6]. Tinsley Harrison encouraged speciality journal clubs in their current format with one participant presenting and the others providing a critique. Multiple systematic reviews to analyse Journal clubs' effectiveness have reported an improvement in reading habits and appraisal skills [7,8].

Traditionally, journal clubs took place in academic institutions with the limited participants being staff and department trainees. These distance and eligibility barriers were breached with the advent of smart devices and high-speed internet for real-time communication. Coupled with multiple online meeting hosting platforms such as Zoom, Microsoft Teams, and others, meeting organisation has never been more effortless. The online meeting's greater flexibility for scheduling is another benefit. A few online journal clubs, viz, Clinical Journal of the American Society of Nephrology's e Journal Club (CJASN eJC), Neph JC and The International Urology Journal Club (#urojc), have successfully carried out productive discussion on various articles using the social media platform "Twitter" [4,9]. Though not exactly journal clubs in the traditional sense, they have been an excellent medium to disseminate ideas and knowledge. Participation in these online journal clubs has been reported to provoke a change in the participants' clinical practice [2].

The most attractive feature of a journal club form of learning is the engagement of all members in the activity [10]. An engaged, interactive discussion put restrictions on the journal club's size; too many people and not everyone can participate, too few, and there is insufficient dialogue to generate fulfilling 2-way interactions. The ideal number is between 6 and 12 [10]. In the weekend JC, as at least four members presented every week, we considered 15 to be the highest number to allow once a month opportunity to be the presenter.

One of the most critical barriers to the journal club was connectivity which is a big challenge in many rural and remote locations because of the cost and limited availability of high bandwidth for video streaming. It was overcome using only audio connectivity and keeping the electronic copy of the PDF open by all participants to highlight or clarify debatable points. Another problem we faced was unexpected power outages causing connectivity loss; as this was unpredictable, we compensated for this by always allocating more journal articles that could be covered each day so that if one presenter could not join, others could carry on without losing time.

One of the original reasons for the initiation of journal clubs was to share expensive print journals in the nineteenth century by William Osler [6]. Since most of the speciality journals continue to be expensive, the institutional fellow in the journal club was the source of articles for distribution within the study group via the institutional access to the various journals, thus eliminating the cost burden to the LMIC participants. The cost of the personal electronic subscription of six commonly used journals for our journal club is around 200 dollars per month beyond the paying capacity of most paediatric surgical specialists in LMIC without institutional affiliations. The international nature of the journal club with affiliation to a teaching hospital allows others to share the educational resources.

The journal club was held at the beginning of the weekend and avoided most professional/personal obligations. The timing was decided after mutual discussions, and it seemed effective as the number of participants continued to increase due to greater interest

as the word regarding the journal club spread to others. The initial participation was from former fellows and trainees but later extended to those not previously associated with the institution.

A journal club is an ideal activity for adult learning where learners express themselves safely in a learning climate, plan and direct the learning towards their own needs, have more control and evaluate and accept and apply their learning to current practice [2]. The Weekend JC satisfied all these requirements. Being democratic allowed the participant to choose subjects of their interest. The discussions, which are similar to group rounds where each participant gets to speak after the journal presentation, allow assimilation of new knowledge in the setting of their own and shared experiences. Group dynamics improve as each member is as important as the next and is the leader of his discussion [3]. The short duration of presentation and discussion ensures constant attention of the participants. The Weekend JC promoted leadership skills by insisting on the host of the discussion outside the educational institution. The JC also helped familiarise the participants with online meeting and collaboration platforms like Zoom as an e-learning tool. The Unique selling point of this journal club is its relevance being a south-to-south collaboration, use of low bandwidth data only requiring audio and extensive participation of the attendees.

There are some differences between the Weekend JC and the other highly successful online discussion clubs, such as #urojc, with a massive international following. While their forum bridges the gap between academicians and practitioners, the article's choice is not always relevant to all the participants [11]. A single sitting discussion of an article, such as the one being done in the Weekend JC, ensures a streamlined flow of knowledge to all the group participants rather than the disjointed and spread-out format on Twitter over two weeks as in #urojc. With influential personalities leading the discussion in #urojc, there is also a possibility of a bias for selecting articles and some participants only being spectators.

Weekend JC is a free small forum extending speciality medical knowledge to children's orthopaedics practitioners in remote areas in LMIC. This approach's novelty over a traditional journal club lies in the article's selection based on participants' needs, the discussion driven by the participants, helping the participants assess the new knowledge, and deciding on its incorporation in their practice. Apart from the educational benefits, various aspects of the participants such as presentation skills, interpersonal interactions and self-confidence are improved, conferring a more holistic improvement. The journal club can foster international collaboration, breaking physical barriers and, in highly specialised disciplines creating relationships between the tertiary care institutions academics and multiple specialised surgeons with skills in district hospitals. These forums are gaining greater importance as waves of the COVID pandemic continue to affect LMIC with a substantial impact on surgical education. The format and findings may be helpful to other subspecialties and regions interested in promoting an on-line educational forum. Based on the success of this pilot initiative and the early data, we plan to continue the program on an ongoing basis.

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