



ORIGINAL ARTICLE

Transition from physical to virtual journal club.

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ABSTRACT... Objective: To determine the effectiveness of Orthopaedic virtual journal club started during COVID-19 pandemic. **Study Design:** Descriptive Cross sectional. **Setting:** Orthopaedic & Traumatology Division Lady Reading Hospital Peshawar, Pakistan. **Period:** 6th February 2021 to 6th June 2023. **Material & Methods:** We selected one original article which was published in Journal of Pakistan Orthopaedic Association (JPOA). The author of that article would present it in synchronous virtual journal club (VJC) on Zoom. Orthopaedic residents from all over Pakistan attended the VJC. All the residents provided feedback (on 5 point Likert scale) by answering 11 questions related to various aspects of their learning experiences which were analyzed to measure the effectiveness of VJC. **Results:** We conducted 12 VJC on various topics. The total number of post graduate residence who attended these VJC were 380. Final year residents were more likely to attend VJC than first year residents ($p=0.02$). After 12 VJC the mean resident participation was 42 ± 1.2 . We received the feedback forms of 344 (90.52%) residents. The VJC was extremely convenient to vast majority (86.62%, $n=298$) of residents. The VJC was perceived very effective and extremely valuable by 90.11% ($n=310$) and 84.59% ($n=291$) residents respectively. Majority (90.11%, $n=310$) of our residents strongly agreed that VJC provided them more understanding of writing an original article. **Conclusion:** Our transition from physical to virtual journal club was very fruitful. Virtual Journal club was an extremely convenient, very effective and extremely valuable form of distant learning. Knowledge, attitude and skills of the residents were improved which support them in their delivery of patient care and improved patient clinical outcome. The VJC provided the residents more understanding of writing an original article.

Key words: COVID-19, Journal Club, Online, Resident, Virtual, Zoom.

INTRODUCTION

A group of people belonging to a particular field meeting at regular interval to discuss scientific articles is called a Journal Club.¹ The first journal club was conducted by Sir William Osler in 1875 in McGill University Canada.² Journal club has several advantages. Firstly the critical appraisal skills of the residents are developed.^{1,3} Secondly, it helps the residents to understand methodology and biostatistics.^{1,4} Thirdly, it motivate the residents to regularly read the recently published literature relevant to their speciality.^{1,5} Fourthly, Journal club helps the residents to integrate the results of research article into their practice.³ Over the last decade online or Virtual Journal Clubs (VJC) have gained more popularity than traditional face-to-face or physical journal clubs mainly because of the added advantage that VJC enable individuals

including authors from across the globe to participate.^{6,7} The VJC is more flexible and the issues of timing, venue and frequency associated with face to face journal clubs are overcome with VJC. The VJC can be Synchronous (through video call via Zoom) or Asynchronous (Social media like Twitter by posting discussion forum).⁷ The journal club is one of the mandatory component of post graduate residency program of College of Physician and Surgeons Pakistan (CPSP) but due to social distancing restriction policy of the Government in COVID-19 pandemic continuation of face to face journal club was not possible. The COVID-19 was an extraordinary event and we were not ready for this transition from “classroom to cloud” or from physical to virtual Journal club. The real challenge was to accomplish learning objective while delivering education through

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distance learning. A synchronous virtual journal club was the best model of distant learning as it had shown to bridge the geographical barriers in pandemic by allowing individuals of multiple institutions to participate. We therefore conducted a regular Synchronous national VJC on Zoom for Orthopaedic residence using the platform of Journal of Pakistan Orthopaedic Association (JPOA). The effectiveness of each Journal club was determined using feedback forms of the participants.

The objective of our study was to determine the effectiveness of Orthopaedic virtual Journal club conducted during COVID-19 pandemic. We hypothesized that VJC is as effective as face to face journal club as perceived by Orthopaedic residents in terms of enhancing their learning experiences and reported through their feedback.

To the best of our knowledge there are no publications describing the effectiveness of VJC in Orthopaedics in Pakistan. We expect that other institutions who intend to implement VJC or Hybrid journal club can benefit from the results of this study.

MATERIAL & METHODS

This cross sectional study was conducted in Orthopaedic division Lady Reading Hospital Peshawar. We conducted regular monthly synchronous virtual journal clubs (VJC) from 6th February 2021 to 11th June 2022 using the platform of Journal of Pakistan Orthopaedic Association (JPOA). All Orthopaedic residents who have attended the synchronous VJC and completed the feedback form were included in this study. Those residents who were not consenting for the study and those with incomplete feedback forms were excluded from the study. One published original article in JPOA was selected for VJC. After consent of the author the full text link along with Zoom registration link was circulated among the Orthopaedic residents via email and social media across Pakistan prior to VJC. Registration was free but mandatory. One senior subject expert was requested to participate in VJC for discussion. The editor in chief JPOA and Managing Editor JPOA were the moderators of session. A standardized

power point template was provided to the author to present the VJC. Few general rules were narrated by the moderator at the start of session to ensure professional behavior and avoid unnecessary criticism.

A uniform standard protocol of journal club was adopted for each VJC. Each virtual Journal Club lasted for one hour. Each zoom VJC was started with recitation of Holy Quran followed by introduction of the author and the subject expert. A 30 minutes presentation was given by the author of article in power point full screen sharing format. Each session was assessed for its strength and limitations by the subject expert. The subject expert critically analyzed the article. Residents were encouraged to ask questions live and in chat box. Questions were answered by author of the article and subject expert. At the end of session link of the feedback form was shared in the chat box and residents were asked to fill the form. Submission of feedback form was mandatory for getting certificate of attendance. The recordings of all VJC are available on YouTube. (link: <https://www.youtube.com/live/SLgJvfle1Xs?feature=share>)

All the residents provided feedback (on 5 point Likert scale) related to various aspects of their learning experiences which were analyzed to measure of effectiveness of VJC. (Table-I). This section of the feedback form had 11 questions. The residents were instructed to tick one answer.

We analyzed our data with SPSS version 27. Quantitative variables were presented as mean and standard deviation while qualitative variables were presented as frequencies and percentages. Comparative analysis of important variables was performed using independent sample t-test. P value < 0.05 was considered significant. Data was presented in tables where necessary.

RESULTS

We conducted 12 virtual journal clubs on various topics which were published as original articles in Journal of Pakistan Orthopaedic Association (JPOA).

S.No	Questions
1.	How convenient was it for you to attend virtual journal club? <input type="checkbox"/> Extremely convenient <input type="checkbox"/> Quite convenient <input type="checkbox"/> Moderately convenient <input type="checkbox"/> slightly convenient <input type="checkbox"/> Not at all convenient
2.	Overall, how satisfied or dissatisfied are you with your experience of this virtual journal club? <input type="checkbox"/> Very satisfied <input type="checkbox"/> Somewhat satisfied <input type="checkbox"/> Neither satisfied nor dissatisfied <input type="checkbox"/> Somewhat dissatisfied <input type="checkbox"/> Very dissatisfied
3.	What was the overall effectiveness of this virtual journal club? <input type="checkbox"/> Not at all effective <input type="checkbox"/> Slight effective <input type="checkbox"/> Moderate effective <input type="checkbox"/> Very effective <input type="checkbox"/> Extreme effective
4.	How do you value this virtual journal club? <input type="checkbox"/> Extremely valuable <input type="checkbox"/> Highly valuable <input type="checkbox"/> Somewhat valuable <input type="checkbox"/> Of little value <input type="checkbox"/> Not valuable
5.	This virtual journal club improved my knowledge, attitude and skills that supported my delivery of patient care. <input type="checkbox"/> Strongly Agree <input type="checkbox"/> Agree <input type="checkbox"/> Neutral <input type="checkbox"/> Disagree <input type="checkbox"/> Strongly Disagree
6.	This virtual journal club increased my competence. <input type="checkbox"/> Strongly Agree <input type="checkbox"/> Agree <input type="checkbox"/> Neutral <input type="checkbox"/> Disagree <input type="checkbox"/> Strongly Disagree
7.	This virtual journal club improved my performance. <input type="checkbox"/> Strongly Agree <input type="checkbox"/> Agree <input type="checkbox"/> Neutral <input type="checkbox"/> Disagree <input type="checkbox"/> Strongly Disagree
8.	This virtual journal club improved my patient's clinical outcome. <input type="checkbox"/> Strongly Agree <input type="checkbox"/> Agree <input type="checkbox"/> Neutral <input type="checkbox"/> Disagree <input type="checkbox"/> Strongly Disagree
9.	This virtual journal club contributed to my professional growth. <input type="checkbox"/> Strongly Agree <input type="checkbox"/> Agree <input type="checkbox"/> Neutral <input type="checkbox"/> Disagree <input type="checkbox"/> Strongly Disagree
10.	I gained more understanding on writing an Original Research Article. <input type="checkbox"/> Strongly Agree <input type="checkbox"/> Agree <input type="checkbox"/> Neutral <input type="checkbox"/> Disagree <input type="checkbox"/> Strongly Disagree
11.	How likely are you to recommend this virtual journal club to a friend or colleague? <input type="checkbox"/> Extremely likely <input type="checkbox"/> Likely <input type="checkbox"/> Neutral <input type="checkbox"/> Unlikely <input type="checkbox"/> Extremely Unlikely

Table-I. Virtual journal club feedback form

(Table-II) JPOA is a subspecialty Orthopaedic journal recognized by Pakistan Medical & Dental Council (PMDC) and Higher Education Commission (HEC) of Pakistan in Y category. It is published quarterly by Pakistan Orthopaedic Association (POA). The total number of post graduate residence who attended these VJC were 380. The residents were from all over Pakistan. Final year residents were more likely to attend VJC than first year residents (72.89%, n=277 versus 17.63%, n=67, p=0.02). About 172(45.26%) residents attended all 12 VJC. After 12 VJC the mean resident participation was 42±1.2. We received the feedback forms of 344(90.52%) residents. Analysis of feedback forms revealed that virtual journal club was extremely convenient to vast majority (86.62%, n=298) of residents. About 75.58% (n=260) of the residents were very satisfied while 9.01% (n=31) were somewhat dissatisfied with VJC. The VJC was perceived very effective and extremely valuable by 90.11% (n=310) and 84.59% (n=291) residents respectively. Majority (81.39%,

n=280) residents agreed that VJC improved their knowledge, attitude and skills that supported them in their delivery of patient care. Increased in competency due to VJC was strongly agreed by 52.32% (n=180) and agreed by 21.80% (n=75). A large proportion (74.12%, n=255) of the residents agreed that VJC improved their performance while 61.04% (n=210) residents agreed that VJC improved their patients clinical outcome. The VJC contributed to the professional growth was strongly agreed by 85.7% (n=295). Majority (90.11%, n=310) of our residents strongly agreed that VJC provided them more understanding of writing an original article and 85.75% (n=295) of the residents were extremely likely to recommend this VJC to their friends and colleague.

DISCUSSION

Very few studies can be found in the literature which primarily focused on journal club in Orthopaedics.^{8,9}

S. No	Article title	Publication details	Authors/presenter names	Date of VJC
1.	Direct access to the proximal posteromedial tibia for fixation of large posteromedial Tibial fractures utilizing the "Lobenhoffer approach" in lateral decubitus position.	Muhammad Imran Haider, Kashif Siddiq Ramay, Zulfiqar Ahmed, M Iqbal Buzdar, Ghulam Haider Qaisrani, & Irfan Ali Shujah. (2020). Direct Access to the Proximal Posteromedial Tibia for Fixation of Large Posteromedial Tibial Fractures Utilizing the "Lobenhoffer Approach" in Lateral Decubitus Position. Journal of Pakistan Orthopaedic Association , 32(03), 130–135.	Dr.Imran Haider Qaisarani	6 th February 2021
2.	Traumatic Brachial Plexus Injuries:HULS protocol of management	Saeed Ahmad, Khalid Masood, Hafiz Muhammad Kashif Shafi, Khalid Zulfiqar Qureshi, Belal Saadat, & Karam Rasool Basra. (2021). Traumatic Brachial Plexus Injuries: HULS Protocol of Management. Journal of Pakistan Orthopaedic Association , 32(04), 206–210.	Dr.Saeed Ahmed	6 th March 2021
3.	Is free hand technique for pedicle screw insertion is safe in st up lacking advanced navigation system?	Waqar Hassan, Shams Ur Rahman, Mehmood UI Hassan, Naeemullah, Wali Mohammad Khan, & Syed Imran Bukhari. (2021). Is Free Hand Technique for Pedicle Screw Insertion Safe in Setup Lacking Advance Navigation System?. Journal of Pakistan Orthopaedic Association , 33(01), 08–12.	Dr.Waqar Hasan	3 rd April 2021
4.	Is Hematoma block effective in reducing distal radius fractures presenting to accidents and emergency department?	Aman ullah Khan Kakar, Muhammad Bakhsh Shahwani, Hameed ullah Panizai, Abdul Khaliq Langov, Iftikhar UI Haq, & Mohammad Ramazan Khan. (2021). Is Hematoma block effective in reducing distal radius fractures in elderly patients presenting to the Accidents and Emergency Department?. Journal of Pakistan Orthopaedic Association , 32(04), 175–179.	Dr.Amanullah Khan Kakar	21 st May 2021
5.	Functional outcome of Arthroscopic Anterior cruciate ligament reconstruction using Hamstring autograft and endo button with supervised physical therapy rehabilitation.	Javed Iqbal, Zainab Aqeel Khan, Faizan Hassan, Behram Sidhwa, Zeeshan Khan, & Umer Butt. (2021). Functional outcome of Arthroscopic Anterior Cruciate Ligament Reconstruction Using Hamstring Autograft and Endo button with Supervised Physical therapy Rehabilitation. Journal of Pakistan Orthopaedic Association , 33(01), 25–30.	Dr.Javed Iqbal	5 th June 2021
6.	Bhatti functional scoring system versus other clinical scores for the evaluation of post surgical reduction of Developmental Dysplasia of hip.	Anisuddin Bhatti, Ayesha Mughal, & Muhammad Yousuf Bhatti. (2021). Bhatti Functional Scoring System Versus Other Clinical Scores for the Evaluation of Post-Surgical Reduction of Developmental Dysplastic Hips. Journal of Pakistan Orthopaedic Association , 32(04), 189–196.	Prof. Dr.Anisuddin Bhatti	8 th July 2021
7.	Comparative analysis of low versus high implant density in decreasing Cobb angle in Lenke type 1 Adolescent Idiopathic Scoliosis.	Latif Khan, Ammar Dogar, Abdullah Shah, Shahzad Ahmed, Ijaz Ahmad, & Amer Aziz. (2020). Comparative Analysis of Low Versus High Implant Density in Decreasing Cobb Angle in Lenke Type 1 Adolescents Idiopathic Scoliosis. Journal of Pakistan Orthopaedic Association , 32(02), 66–71.	Dr.Latif Khan	6 th August 2021
8.	Comparison of clinical and radiological outcome of free hand patellar resection technique versus cutting guide technique in total knee replacement.	Ahmad Jamal, M. Umar, Imam ud Din, Azhar Rashid, Asad ullah Mehmood, & Muhammad Umair. (2021). Comparison of Clinical and Radiological Outcomes of Freehand Patellar Resection Technique Versus Cutting Guide Technique in Total Knee Arthroplasty. Journal of Pakistan Orthopaedic Association , 33(01), 31–35.	Dr.Ahmad Jamal	4 th September 2021
9.	Outcome of infected non union of long bone fractures of the lower limb using Ilizarov ring fixator.	Mahmood UI Hassan, Waqar Hassan, Aimal Sattar, Rafi Ullah, & Akhtar Hussain. (2020). Outcome of Infected Non-Union of Long Bone Fractures of the Lower Limb Using Ilizarov Ring Fixator. Journal of Pakistan Orthopaedic Association , 32(01), 35–43.	Dr.Mehmood ul Hasan	8 th October 2021
10.	Etiology of total knee arthroplasty failure and functional outcome of revision knee arthroplasty	Hussain Wahab, Talal Aqueel Qadri, Ammar Mohammad Ali Abbas, Junaid Khan, Mujahid Jamil Khattak, Masood Umer, & Pervaiz Mehmood Hashmi. (2021). Etiology of Total Knee Arthroplasty Failure and Functional Outcome of Revision Knee Arthroplasty. Journal of Pakistan Orthopaedic Association , 33(04), 157–161.	Dr.Hussain wahab	14 th January 2022
11.	Comparison of double Peroneus Longus with Quadrupled Hamstring in Primary Anterior Cruciate Ligament Reconstruction.	Usama bin Saeed, Javed Awan, & Basharat Manzoor. (2021). Comparison of double Peroneus Longus with Quadrupled Hamstring in Primary Anterior Cruciate Ligament Reconstruction. Journal of Pakistan Orthopaedic Association , 33(04), 145–151.	Dr.Usma Bin Saeed	4 th March 2022
12.	Outcome of two ring Hybrid Ilizarov fixator in the management of Proximal Tibial fractures in adults.	Muhammad Badar Ud Din Zafir, Tariq Mahmood, Azmat Rasool, Ahmad Awad Ahmad, Muhammad Shafee, Arif Mustafa Khan, Khail Ahmad Gill, & Sohail Safdar. (2021). Outcome of Two Ring Hybrid Ilizarov Fixator in the Management of Proximal Tibial Fractures in Adults. Journal of Pakistan Orthopaedic Association , 33(02), 47–52.	Dr.Badaruddin Zaffir	11 th June 2022

Table-I. Details of research papers presented and discussed in virtual journal club.

Furthermore since there is no gold standard for measuring the success or effectiveness of VJC therefore we used the residence feedback form to determine the usefulness of VJC.¹⁰ Literature however revealed that students perception is one of the most powerful and highly accepted criteria to determine their learning experience of a new strategy and to predict sustainability of that strategy.^{11,12}

The results of our study showed virtual journal club was extremely convenient to vast majority (86.62%, n=298) of our residents. Most (81.39%, n=280) of our residents agreed that VJC improved their knowledge, attitude and skills that supported them in their delivery of patient care. The VJC contributed to the professional growth was strongly agreed by 85.7% (n=295) residents. Most (90.11%, n=310) of our residents strongly agreed that VJC provided them more understanding of writing an original article. Linzer¹³ proposed that the three main goals of a journal club are development of critical appraisal skills, integration of evidence into clinical practice and knowledge of current literature. Greene⁹ examined 161 residency programs of Orthopaedics and noted that 97% (n=147) had regular journal clubs. He noted that the goal of Orthopaedic journal club was to develop critical appraisal skills in 67% residents, reading journal articles in 30% and knowledge of recent advances in Orthopaedics in 14% residents. Aweidi¹⁴ conducted a systemic review and concluded that online journal can promote change in clinical practice, enhancing appraisal skills and had higher satisfaction rates. Lack of intensity of discussion, and issues relating to the connectivity are however some of the disadvantages. Morris and Henry¹⁵ conducted virtual journal clubs for Orthopaedic house officer in North West Thames Deanery and noted that 90.9% of the participants agreed that virtual journal club was more convenient than traditional face to face journal club. These authors concluded that virtual journal club is more accessible with more expert contribution than traditional face to face journal club.

Similar to our study Oliphant and colleagues¹⁶ conducted 8 VJC and noted that senior residents

were more likely to participate in VJC than junior residents. Majority of the trainees considered VJC feasible to participate and very useful in developing critical appraisal skills. As a result of discussion in VJC the participants were able to publish 8 letters to the editors in various journals and 22 attained the status of authors.

Our VJC was effective and successful because we had a committed and dedicated team. Chetlen and Dell⁶ proposed that for any VJC to be effective and successful it should have a committed leader and trained expert in facilitating the discussion, the meeting time should be convenient to the maximum participants, the VJC should have a formal structure and the reading material should be circulated prior to VJC.

COVID-19 pandemic had caused a shift from face-to-face teaching to online teaching strategies.¹⁷ The VJC proved to be cornerstone of medical education. The VJC was a strong solution to the multiple educational challenges encountered during distance learning in COVID-19 pandemic.¹⁸ The VJC proved to be more effective than face to face journal club not only in Orthopaedics but in other subspecialties like radiology and maxillofacial surgery and many authors advocated to prefer a Hybrid form of journal club in post pandemic era.^{19,20} Incorporation of "Virtual Patient" and simulation will be part of virtual journal club in future.¹⁰

Our VJC was unique because we invited the authors of articles to present their work, share their insight and reflection with the residents. The topic selected for the VJC were relevant and interesting to the residents. The subject expert gave useful tips to the residents for developing their own research. The VJC was particularly useful for those residents who have completed their training and are no longer posted in academic institutions. We predict that VJC will continue to evolve and grow. It will be difficult to define VJC universally in the future due to the development of many technologies and platforms. VJC will perform a leading role in medical education in the future.⁶

Our study relied on the feedback of participating

residents we had developed the feedback form but we were unable to formally validate it. Specific standardize self-assessment tool are therefore needed to determine the effectiveness of journal club and validate our results. Our study is however reliable because we took feedback from same residents who transitioned from face-to face to VJC. The limitation or barriers to VCJ include interrupting internet connection, the hesitancy of a senior Orthopaedic expert who might not be familiar with technology tools, besides lack of motivation and lack of confidence. Furthermore it is difficult sometimes to engage all the participants of VJC.

The journal clubs is an educational activity that need to evaluated periodically. The residents should be asked anonymously about the shortcomings of journal clubs. Our measure of success or effectiveness of journal club was the feedback form rather determining improvement through self assessment of the residence itself.

CONCLUSION



Our transition from physical to virtual journal club was very fruitful. Virtual Journal club was an extremely convenient, very effective and extremely valuable form of distant learning. Knowledge, attitude and skills of the residents were improved which support them in their delivery of patient care and improved patient clinical outcome. The VJC provided the residents more understanding of writing an original article. The VJC can persist beyond pandemic as a sustainable mode of delivery as such or in hybrid form because it is an accessible and a flexible form of remote learning.
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AUTHORSHIP AND CONTRIBUTION DECLARATION

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1	Faaiz Ali Shah	Conception & design of study, analyze critically for important intellectual content, final approval.	
2	Khalid Mahmood Qureshi	Data collection, Data analysis, Drafting.	
3	Ayesha Saeed	Data collection, Data analysis, Drafting.	