

Original Research



Students' perception of implementing journal clubs in an undergraduate medical curriculum

Rajani Ranganath^{1*}, Smitha Elizabeth², Dhaval Mahadevwala³

¹Department of Pathology, College of Medicine and Health Sciences, The National University of Science and Technology, Sohar, Sultanate of Oman

²Department of Anatomy, College of Medicine and Health Sciences, The National University of Science and Technology, Sohar, Sultanate of Oman

³Department of Epidemiology, Public health and Biostatistics, College of Medicine and Health Sciences, The National University of Science and Technology, Sohar, Sultanate of Oman

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Abstract

Background: Journal club is an essential teaching-learning activity that provides a forum for developing skills in critical appraisal. It helps in keeping abreast of new knowledge, facilitating the application of new research in improving patient care, and aiding medical students to be competent clinicians. The current study aimed to elucidate whether students are aware of the concept of a journal club and their willingness to implement a journal club in their undergraduate medical curriculum.

Methods: A cross-sectional study was conducted among the undergraduate medical students at the College of Medicine and Health Sciences, The National University of Science and Technology, in February 2019. A structured questionnaire of 8 items was administered that assessed the knowledge, attitude, and perceptions towards implementation of a journal club (JC) in an undergraduate curriculum among medical students. A total of 161 undergraduate medical students participated in the study.

Results: Of the 161 students, 112 (69.4%) were in their preclinical years, and 49 (30.6%) were in their clinical years. In all, 145 students were female and 16 were male. Majority of students in their preclinical years (70.5%) were not aware of the journal club. Among the five reasons given for journal clubs to be included in the curriculum, the largest number of students (30.8%) wanted a journal club because it would help them to gain confidence to present cases in clinics and exams. The most common reason students did not want a journal club was that it requires a great deal of time to prepare (64.3%).

Conclusion: The introduction of a journal club would enhance the proficiency of undergraduate students to be lifelong learners. It is a robust educational tool to equip them with knowledge of research practices that would aid in better patient care.

Introduction

Journal club (JC) is a timely meeting of research group members where a research article is presented by one person and research group members then discuss the clinical applicability and critique the article. Journal clubs can be an excellent way to learn and practice evidence-based medicine (EBM). Evidence-based medicine has become a matter of great importance to bridge the gap between production and implementation of knowledge.¹ Hence journal clubs are suggested as an outstanding teaching-learning method that fosters the understanding, attitudes, motivation, and competencies that are essential for EBM.

Journal clubs largely focus on current research papers

and are an excellent way of teaching undergraduates to develop their abilities in critical thinking, analyze experimental data, and be exposed to current and cutting-edge methodologies and ideas in research. Encouraging continuous learning and reading primary literature enhances skills, knowledge, and competencies of the students. A study conducted in a Research I science university in the USA found that journal club increased students' skills, interest, and confidence in science.² The integration of research literature into classroom activities has been shown to be an effective strategy for developing critical thinking across multiple science disciplines.³

One study reported that participation in an active learning-based undergraduate journal club, student

*Corresponding author: Rajani Ranganath, Email: rajaniranganath@nu.edu.om

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performance, particularly in lower-achieving students, improved students' research paper presentations⁴.

Implementing and conducting successful journal clubs for undergraduates is a challenging task. One of the common concerns is that the use of higher-level language in research literature can hinder students' understanding and applying knowledge beyond traditional textbooks. Many residents feel that presenting in journal clubs is an intimidating process and is one of the reasons for unsuccessful journal clubs.⁵

Therefore, it is important to overcome the pitfalls of the implementation of journal clubs for undergraduate medical students. Efforts should be made to present innovative journal clubs that can create interest in students, build foundational knowledge and enhance critical appraisal thinking.

The aim of the study

- To know whether students are aware of the concept of journal club.
- To assess students' willingness to implement journal clubs in their undergraduate medical curriculum.

Methodology

This is a cross-sectional study conducted among undergraduate medical students at the College of Medicine and Health Sciences, The National University of Science and Technology, in February 2019. This study was conducted to understand the perception of students around the implementation of journal club in an undergraduate curriculum.

Convenience sampling was conducted. All medical students were sent invitations and consent forms to their group emails to participate in the survey.

- Inclusion criteria- All students who gave consent to participate.
- Exclusion criteria – Premedical students; students who did not give consent.

A survey was conducted among 161 students undergraduate preclinical and clinical year students. The purpose of the study was explained and instructions for filling out the survey forms were given. A questionnaire containing 8 items was administered using Google Forms to students' emails. Students were given sufficient time to answer all questions.

A survey-based questionnaire was developed after several literature reviews. This questionnaire was created to address the knowledge, attitudes, and perceptions towards the implementation of a journal club in the undergraduate curriculum among undergraduate students. An attempt was made to identify questions that were appropriate for the pre-selected domains. Five questions addressed knowledge and perceptions of journal club and three questions addressed attitudes towards the implementation of journal club. The questionnaire was evaluated for relevance, clarity, grammar /spelling, ambiguity,

and sentence structure by four subject experts at the university for content and face validity. The four experts were preclinical faculty who had sufficient experience in conducting journal clubs for postgraduates in medical colleges. They were given a cover letter that explained the purpose of the study, the reasons for selecting the content expert, a description of the questionnaire, and an explanation of the content evaluation procedure. The experts scored each question as follows: Strongly agree-5, Agree-4, Neutral-3, Disagree-2, and Strongly disagree-1. The experts were asked to provide suggestions for revision or deletion of the questions to which they gave a lower score (1 or 2). For questions in need of revision, the experts were requested to comment on the clarity and to provide a suitable option of addressing the relevance of the question. The Item-Content Validity Index (I-CVI) estimations for the 8 KAP items that ranged between 0.78 and 1.00 were retained after the evaluation of the panelists, indicating that these items were considered clear, understandable, and relevant to the questionnaire. The modified Kappa (K*) values for all items were excellent (>0.75), illuminating that the agreement between experts was not due to chance. The Scale Content Validity Index (S-CVI/Ave) was 0.90, confirming the content validity of the scale.

The internal consistency reliability, Cronbach's alpha, was measured to be 0.782. The questionnaire was reviewed and approved by the Research and Ethics Committee. (Reg.no -CMHS/REC/016/18/C).

Data were analyzed using SPSS version 22. Descriptive statistics (The frequency with percentages for categorical variables) were used for the study variables, and chi-square (X²) test was applied to establish statistical significance.

Results

A total of 161 (N=161) students from preclinical and clinical years participated in the survey. In all, 112 (69.4%) students were from preclinical years and 49 (30.6%) were from clinical years. About 90% (n=145) of the students were female and 10% (n=16) were male.

Majority of the students from preclinical years (70.5%; n=79) did not know what a journal club was but many students (59.1%; n=29) from the clinical years knew about journal club. The difference between preclinical and clinical years regarding knowledge of journal club was statistically significant as shown in Table 1 (significance: $P<0.05$).

Regarding the source of information about journal club, majority of the students came to know about journal club through friends/seniors (40.9%), followed by the internet (36.4%), through attending journal club (10.2%), and 17% of the students learned about journal club through literature. Students were able to select multiple responses.

The overall percentage of students asked for the role of the journal club in improving knowledge and skills choosing "yes" was 65.2% (n=105) shows that it certainly

Table 1. Students’ knowledge of journal club (N=161)

	Do you know JC				Total		P value
	Yes	Percent	No	Percent	Total Students	Percent	
Preclinical	33	29.5%	79	70.5%	112	69.4%	<0.0001
Clinical	29	59.1%	20	40.9%	49	30.6%	
Total	62	38.5%	99	61.5%	161	100%	

Abbreviation: JC, journal club

improves the medical knowledge /clinical skills. In addition, 26.2% (n=42) chose “yes, but not now.” 7.5% (n=12) did not agree (Table 2).

An important aspect of journal club is that journal club helps update knowledge of current medical literature. Majority of the students from both clinical and preclinical years (71.4%; n=115) agreed; only 5.6% (n=9) did not agree. However, 21% (n=34) were not sure whether journal clubs help in updating knowledge. These results are shown in Table 3.

When questioned about the fact that the journal clubs play a major role in motivating research activities, 49.0% of students overall chose “yes”, 12.4% chose “no,” and 36.6% said they were not sure.

Almost half of the students (46.1%; n=74) said they would like to have journal clubs incorporated in their curriculum, while 30.4% (n=49) of students said it would not make a difference and 22.3% (n=36) of students did not want it to be included in their curriculum.

Among the five reasons for journal clubs to be included in the curriculum, the option chosen most often (30.8%) was to help them gain confidence to present cases in the clinics and exams. Next highest was 21.2 % for the option to create awareness about current research updates, then 19.9 % for helping gain a deeper understanding of the subject, 18.6% for motivating self-learning, and 9.6% for giving the opportunity to learn biostatistics (Figure 1).

Table 2. Role of journal club in improving medical knowledge /clinical skills

	Year		Total
	Preclinical	Clinical	
Not answered	2	0	2
Yes	75	30	105
Yes, but not now	26	16	42
No	9	3	12
	112	49	161

Table 3. Role of journal clubs in updating knowledge of current medical literature

Response	Year		Total
	Preclinical	Clinical	
Not answered	2.7%	0.0%	2.0%
Yes	70.5%	73.5%	71.4%
No	6.3%	4.0%	5.6%
Not sure	20.5%	22.5%	21.0%
Total	100%	100%	100%

Of the five reasons for a journal club not to be included in the curriculum, the results are as follows in descending order: 92 students felt JC required a lot of time to prepare; lack of sufficient resources (n=25); stage fright (n=14); difficulty in understanding statistics (n=12); JC would not help much at (n=10). Students were encouraged to choose multiple options (Figure 2).

Discussion

Medical education in the new era has made it essential for teachers to deliver the curriculum in a planned manner to keep pace with modern educational developments. Several innovative teaching methods, such as PBL, TBL, integrated teaching and evidence-based learning, are being investigated and practiced for a better understanding of these subjects.

Journal clubs can also be used as a teaching-learning method that promotes understanding, attitudes, motivation, and competencies essential for practicing evidence-based care. Journal clubs are usually implemented for different purposes in different settings, such as journal clubs for health professionals to improve clinical practice, apply research into practice or develop their skills in setting clinical questions, discussing, evaluating, and updating scientific knowledge. ⁶

Journal clubs are important forums for keeping up-to-date knowledge with the latest research happening worldwide. Critical analysis of the research studies helps in self-appraisal and improves skills associated with evidence-based medicine. Journal club remains one of the most essential parts of the postgraduate curriculum, but it is usually not included in the undergraduate medical curriculum. Majority of our students did not know about journal club. Most students learned about it through friends or seniors or the internet. Only a few students had attended journal clubs conducted in college for faculties.

Regular didactic lectures, seminars, and formal assessments are not sufficient in modern medicine. There is a need for competency in seeking knowledge, clinical skills, and evidence-based practice ⁷. Journal clubs not only improve knowledge and reading habits but also help in keeping the momentum of medical knowledge and creating enthusiasm for conducting research. A discussion of research articles will benefit the participants by increasing the depth of their knowledge. ⁸ A previous study reported that participation in an active learning-based undergraduate journal club improved student

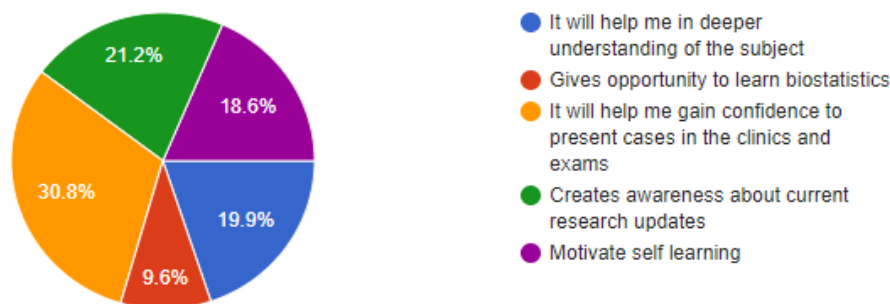


Figure 1. Reasons for including journal clubs in undergraduate curriculum

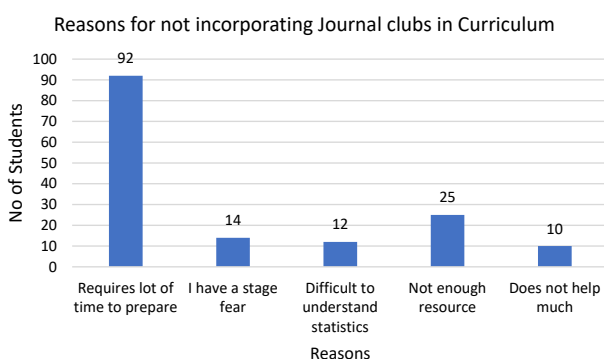


Figure 2. Reasons for not including journal clubs in the curriculum

performance in research paper presentations (science communication), particularly in lower-achieving students.

Majority of our students agreed with the fact that the journal club helps improve medical knowledge, clinical skills, and update knowledge of current medical literature. Similar results were seen in a study conducted for nursing students where most (75%) of the students reported that their competency to search, evaluate and report scientific knowledge had improved.⁷

Reading the primary literature is the best way, apart from doing research, to learn how research is performed and presented.⁹ Undergraduate students require confidence in their capacity to read such specialized writing so that they can effectively contribute to journal club. Some of the students (26.2%) in our study felt that although journal club would help update their knowledge, it will be more helpful only at later date and not at the present time.

About half of the students (49%) agreed that journal clubs would motivate them to undertake research. Since many of the students did not know what journal clubs were, they either had a neutral opinion or they disagreed. An intervention study conducted by Sandeuffer with university students found that all the students who participated in the study were so motivated that they were interested in research-based graduation studies in the future.¹⁰

Journal clubs as evidence-based teaching have many advantages. They help in a deeper understanding of the subject, give the opportunity to learn biostatistics and create awareness about current research updates. A 2001 systematic review found that journal clubs can improve reading practices, knowledge of clinical epidemiology and biostatistics, and the use of medical literature for residents and registrars.¹¹

Mark et al introduced several ten-step guidelines in their journal club program for medical residents at the New York University School of Medicine to help presenters increase efficiency in assessing a study's validity and results. As a result, residents improved both their presentation and critical appraisal skills, which in turn helps them in patient case presentations in clinics and exams.¹² Most of our students wanted journal clubs in their curriculum for the same reason.

Adult Learning Theory is intended to promote students towards self-directed learning. Several kinds of literature have come up with studies that focus on teaching self-directed learning (Green & Ellis 1997; Hartzell 2007).^{13,14} Self-learning gives residents personal responsibility for their education. More importantly, it teaches a set of skills that they will be able to use throughout their career after residency which will give them confidence and independence in their future practice. Identifying specific models to practice these skills is essential if programs expect graduating residents to be confident and successful in using these after their training is completed. Zoshua et al. reported that a journal club model developed for residents helped them use the skills learned in journal club for their patient care. It also increased their confidence level in evaluating medical literature and contributed to an improved sense of independence as a physician.¹⁵ Around 18.6% of our students in our survey felt that journal clubs would motivate self directed learning.

Journal clubs are not an integral part of the undergraduate curriculum; hence, it becomes critical to select the most crucial articles for presentation for successful journal clubs. The topics selected from the curriculum should be beneficial and interesting to the students. Supportive mentorship and guidance from a

devoted faculty member also ensures the maintenance of the structure and systematic presentation, which will help residents be creative and innovative in their presentations.

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One of the limitations for implementing journal clubs is participation from the students. Majority of our students (64.3%) did not want journal clubs to be incorporated into their curriculum since they require a great deal of time to prepare. Some students say they have stage fright, and some do not feel they understand the statistics sufficiently to be able to present a paper.

Many residents felt that presenting journal club would be an intimidating process for several reasons, including the fact that they are already burdened with many subject lectures, assessments, and assignments. Inadequate infrastructure, faculty, high-speed internet, etc., may also be factors weighing against inculcating journal club into the curriculum.¹⁷ Around 17.5% of our students did not want journal club because they felt there were not sufficient resources to support it.

To summarize, some students in our study were aware of journal club through friends, the internet, and the literature. Majority of the students would like to have journal clubs as they think it would give them confidence in presenting cases, especially during their OSCE exams. Journal clubs are time-consuming and hence some students may not like to have journal clubs to be implemented in the curriculum. However, efforts could be made to see that journal clubs do not affect regular curricular activities and that the topics selected would be from the curriculum so that students would not have the burden of spending time on unrelated topics. Journal clubs should not be a “fall-flat” session but a lively discussion that not only brings research into practice but also gives undergraduates lifelong learning skills that will continue to be useful throughout their career.

Conclusion

Incorporating a journal club in an undergraduate curriculum will help students gain a deeper understanding of the subject, help them to analyze, familiarize them with biostatistics, and inspire them to conduct research in the future. Majority of our students showed a willingness towards the implementation of journal clubs. Hence it is necessary to motivate and help them realize that journal club is a teaching-learning methodology which can immensely improve their presentation skills which are analogous to their case presentations in clinics or exams. Journal clubs, when initiated at the undergraduate level, can help students develop into a great researcher, presenter, and investigator.

The most common concern for the implementation of journal clubs is the time factor. Students think it requires a lot of time which may hinder their performance in major subjects. Therefore, journal clubs for students should be scheduled in such a way that it should not affect their

regular academic commitments and should be tightly entwined with the curriculum to provide greater depth and learning.

Ethical approval

Reviewed and approved by Research and Ethics committee of College of Medicine and Health Sciences, National University of Science and Technology, Oman. Reg.no -CMHS/REC/016/18/C.

Competing interests

None.

Authors' contributions

Conceptualization: RR, SM, Data curation: RR, SM, Formal analysis: RR, DM. Methodology: RR, SM, DM. Visualization: RR, SM. Writing-original draft: RR. Writing review & editing: RR, SM, DM

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References

1. Lee AG, Boldt HC, Golnik KC, Arnold AC, Oetting TA, Beaver HA, et al. Structured journal club as a tool to teach and assess resident competence in practice-based learning and improvement. *Ophthalmology*. 2006;113(3):497-500. doi: 10.1016/j.ophtha.2005.12.010.
2. Sandefur CI, Gordy C. Undergraduate journal club as an intervention to improve student development in applying the scientific process. *J Coll Sci Teach*. 2016;45(4):52-8.
3. Breakwell DP. Using the primary literature in an allied health microbiology course. *Microbiol Educ*. 2003;4:30-8.
4. Robertson K. A journal club workshop that teaches undergraduates a systematic method for reading, interpreting, and presenting primary literature. *J Coll Sci Teach*. 2012;41(6):25-31.
5. Al Achkar M. Redesigning journal club in residency. *Adv Med Educ Pract*. 2016;7:317-20. doi: 10.2147/amep.s107807.
6. Kleinpell RM. Rediscovering the value of the journal club. *Am J Crit Care*. 2002;11(5):412-4.
7. Steenbeek A, Edgecombe N, Durling J, LeBlanc A, Anderson R, Bainbridge R. Using an interactive journal club to enhance nursing research knowledge acquisition, appraisal, and application. *Int J Nurs Educ Scholarsh*. 2009;6:Article12. doi: 10.2202/1548-923x.1673.
8. Laaksonen C, Paltta H, von Schantz M, Ylönen M, Soini T. Journal club as a method for nurses and nursing students' collaborative learning: a descriptive study. *Health Sci J*. 2013;7(3):285-92.
9. Minerick AR. Journal club: a forum to encourage graduate and undergraduate research students to critically review the literature. *Chem Eng Educ*. 2011;45(1):73-82.
10. McDonough V. Improving journal club: increasing student discussion and understanding of primary literature in molecular biology through the use of dialectical notes. *Biochem Mol Biol Educ*. 2012;40(5):330-2. doi: 10.1002/bmb.20640.
11. Sandefur CI, Gordy C. Undergraduate journal club as an intervention to improve student development in applying

- the scientific process. *J Coll Sci Teach*. 2016;45(4):52-8.
12. Ebbert JO, Montori VM, Schultz HJ. The journal club in postgraduate medical education: a systematic review. *Med Teach*. 2001;23(5):455-61. doi: 10.1080/01421590120075670.
 13. Schwartz MD, Dowell D, Aperi J, Kalet AL. Improving journal club presentations, or, I can present that paper in under 10 minutes. *Evid Based Med*. 2007;12(3):66-8. doi: 10.1136/ebm.12.3.66-a.
 14. Green ML, Ellis PJ. Impact of an evidence-based medicine curriculum based on adult learning theory. *J Gen Intern Med*. 1997;12(12):742-50. doi: 10.1046/j.1525-1497.1997.07159.x.
 15. Hartzell JD. Adult learning theory in medical education. *Am J Med*. 2007;120(11):e11. doi: 10.1016/j.amjmed.2006.10.024.
 16. Elizondo-Omaña RE, Zarate-Garza PP, Jacobo-Baca G, Salinas-Alvarez Y, Fernandez-Rodarte BA, Martinez-Garza JH, et al. Collaborative mentoring for effective medical research groups. *MedEdPublish*. 2019;8(3):1-13. doi: 10.15694/mep.2019.000214.1.
 17. Ranganath R. Journal clubs in undergraduate medical curriculum: ingenious way of teaching. *J Res Med Educ Ethics*. 2019;9(1):1-4. doi: 10.5958/2231-6728.2019.00001.5.