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Evidence-based dentistry: structuring a Journal Club, a teaching and learning strategy

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REVISÃO DE LITERATURA

RESUMO

Introdução: Os Journal Clubs (JC) são grupos de indivíduos que se reúnem, a fim de discutir e revisar evidências científicas presentes em periódicos atuais, buscando desenvolver habilidades de leitura crítica. **Objetivo:** Reunir relatos da literatura sobre a idealização e desenvolvimento de Journal Clubs e, consequentemente, relatar a estruturação do primeiro Journal Club de caráter regular do curso de Odontologia da UFPR. **Método**: Foram selecionados 28 artigos nas bases de dados Pubmed, Google Scholar, Scielo, Science Direct, Scopus, os quais eram apontados de maior relevância nessas bases e, além disso, mostravam a estruturação de Journal Clubs após a leitura dos resumos. Os dados foram tabulados e divididos em categorias: Participantes, modelo das reuniões, temática abordada, instrumentos de avaliação dos artigos, escolhas pedagógicas para o funcionamento e avaliação da atividade, pontos positivos e negativos elegidos como variáveis importantes para a criação de um Journal Club. **Resultados:** Estruturou-se o JC em encontros de 1 hora, realizados mensalmente, abertos ao público, com tema livre, mas relacionado à prática clínica. Dois discentes seriam responsáveis por escolher e apresentar um artigo recente, de alto fator de impacto e publicado em inglês, além de mediar a discussão no encontro, sob a supervisão do tutor e de um profissional convidado especialista. Os encontros contarão com uma apresentação de 20 a 30 minutos, seguido de um debate. Ao final da sessão, pretende-se enviar um formulário com perguntas sobre a experiência de participar da atividade, possibilitando aos organizadores discutir e propor melhorias para as próximas edições. **Conclusão:** Um Journal Club bem estruturado pode se apresentar como uma opção extracurricular para alunos de graduação, principalmente na área da saúde. Permite que os discentes se aproximem de evidências científicas, desenvolvam pensamento crítico e fomentem o conhecimento prático a ser aplicado por futuros profissionais.

Palavras-chave: Educação em Odontologia; Odontologia Baseada em Evidências; Prática Clínica Baseada em Evidências.

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ABSTRACT

Introduction: Journal Clubs (JC) are groups of individuals who meet to discuss and review scientific evidence published in current journals, aiming to develop critical reading skills. **Objective**: To gather reports from the literature on the design and development of Journal Clubs and, consequently, to describe the structuring of the first regular Journal Club of the Dentistry course at UFPR. **Method**: A total of 28 articles were selected from the PubMed, Google Scholar, Scielo, Science Direct, and Scopus databases, chosen for their higher relevance within these platforms and for presenting Journal Club structures based on the abstracts. Data were organized and divided into categories: participants, meeting models, topics addressed, article evaluation tools, pedagogical choices for conducting and evaluating the activity, and positive and negative points considered important variables for creating a Journal Club. **Results:** The JC was structured into one-hour meetings, held monthly, open to the public, with a free topic related to clinical practice. Two students would be responsible for selecting and presenting a recent, high-impact article published in English, as well as mediating the discussion during the meeting under the supervision of a tutor and an invited specialist. The meetings would feature a 20 to 30-minute presentation, followed by an open debate. At the end of each session, a feedback form would be sent with questions about the experience of participating in the activity, allowing the organizers to discuss and propose improvements for future editions. **Conclusion:** A well-structured Journal Club can serve as an extracurricular option for undergraduate students, especially in health-related fields. It enables students to engage with scientific evidence, develop critical thinking, and foster practical knowledge to be applied in their future professional practice.

Keywords: Dental education; Evidence-based dentistry; Evidence-based clinical practice.

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INTRODUCTION

Journal Clubs (JC) are defined as an interactive approach to critically appraising scientific evidence, in which a group of individuals meet regularly to discuss and critically evaluate current medical literature. However, despite being referenced in North American literature for over a century and having changed during that time, there is still no fully accepted definition (16). The earliest reference to a JC is found in the memoirs and letters of Sir James Paget (1835–1854), described as a small group of students who met in a room above a bakery near St Bartholomew's Hospital London to read scientific journals. Some authors describe that the first documented journal club was organized in 1875 by William Osler at McGill University, with the aim of keeping staff informed about medical science in a cost-effective manner (11,16,27).

One of the aims of the journal club is to promote the incorporation of research evidence into clinical practice, and it is considered a way of teaching critical reading skills, thus characterizing it as a recommended method of reviewing and discussing scientific literature, used in both clinical and academic environments, strengthening evidence-based practice (2,8,16,27). Despite the centuries-old tradition of journal clubs and their importance in keeping professionals, especially health professionals, informed about their fields, this activity is rarely reported in undergraduate dental courses.

The Tutorial Education Program (PET) in Dentistry at the Federal University of Paraná (UFPR) is an extracurricular activity that seeks to promote the inseparability of teaching, research, and outreach. It consists of a group of selected students who meet regularly and carry out activities guided by scientific knowledge, practicing evidence-based dentistry that is committed to social issues, integrating the University's activities with outreach and research practices, in the search for a broader academic education. The main objectives of PET groups are to contribute to improving the quality of academic education for undergraduate students, not only for the students in the group, but for all students in the course; to encourage the search for scientific knowledge through research initiation activities; to enable the application of this knowledge in outreach activities, promoting the exchange of experiences in a critical and mutual learning process, in contact with the academic community and society; to contribute to the training of health professionals in outreach activities, in order to form active multipliers,

thus contributing to improving the quality of life of the population (23).

Therefore, the aim of this study was therefore to gather experience reports from the literature on the idealization and implementation of Journal Clubs and consequently identify relevant points for structuring the first regular Journal Club of the Dentistry course at UFPR linked to PET-Dentistry activity in the annual planning of the Tutorial Education Program of the Dentistry course at UFPR. The topics searched for in the literature included: Participants, meeting model, topic covered, article evaluation instruments, pedagogical choices for the functioning and evaluation of the activity, positive and negative points, motivating points the structuring of Journal Clubs in Tutorial Education Program across the country.

METODOLOGY

The search strategy for reports in the literature was initially broader, that is, it was not limited to a specific course or academic level. Once the data had been analyzed, there was a new search in the literature, now with the aim of finding reports in the area of health, with a greater focus on dentistry, and at undergraduate level. There was no exclusion criterion; the studies were selected by the fellows according to the degree of relevance, detail and fit within the intended search categories. There was no set time interval for the selection of publications and, although no preferred language was established for the searches, the studies analyzed and selected were in English, Portuguese and Spanish due to the greater number of results found. For the search, the descriptors ‘Journal Club’, ‘experience’, ‘dentistry’, ‘health’, ‘undergraduate’, ‘book club’ were used in the following databases: Pubmed, Google Scholar, Scielo, Science Direct, Scopus.

In total, 29 articles were selected, and among these, 19 articles that reported the structure of a JC were listed, organized for data tabulation and separated into categories: Participants, meeting model, topic covered, article evaluation instruments, pedagogical choices for the functioning and evaluation of the activity, positive and negative points, with the aim of gaining a better understanding of the variables used to create a Journal Club.

RESULTS

The studies reviewed below will be highlighted according to each of the variables analyzed and the most relevant points for structuring the JC will be reported. The results of the 19 tabulated articles are presented objectively in Table 1.

1.Participants:

Although some articles on Journal Club's do not clearly identify the number of participants (20,24,25), a systematic review published in 2011 on the topic selected eight studies that had between 9 and 16 participants (14). However, the number of participants described in the literature can be quite large, ranging from fewer than a dozen to just over two hundred. The variation in group size is surprising, given that many journal clubs rely on Linzer's definition, which values discussion as an important part of the process. In Linzer's studies published in 1987 and 1988, the groups had 22 and 43 participants respectively. On the other hand, some authors suggest that the ideal group size for a JC would be eight participants. According to this view, groups should be small enough to promote learning and decision-making through interaction (10).

2.Meetings:

The analyzed articles report meeting durations ranging from 15 minutes to 2 hours, with the most common length being approximately 45 minutes (26) to 1 hour (1,4,9,20,24,28). Meeting frequency was most often reported as weekly or monthly, although some studies described fortnightly (25) or bimonthly (20) meetings. Regarding accessibility, fewer than half of the described meetings were open to the entire community, as most were restricted to specific interest groups or themes (1,20,22,24,25).

3.Themes:

Regarding topics, the literature recommends that Journal Club meetings focus on subjects that are current (25), relevant to the needs of healthcare students, applicable to clinical practice (6,28), and include the discussion of patient cases (14). In some of the reported JCs, undergraduates were responsible for choosing articles based on their interests (7,12,26,29) or related to their own research work, such as theses (4).

In other groups, a coordinator or tutor either selected the articles directly or guided the students' choice of texts (9,12,13,21). One reported JC model divided its sessions into two main themes: methodological and clinical, with specific subjects for each theme being defined monthly (19).

4. Use of critical appraisal tools for articles:

Although many authors cite no experience of standardized instruments for critically evaluating articles (1,3,4,6,7,14,15,20,21,22,24,25,26,29), others differ on the best way to do it. In one model, undergraduate medical students at Newcastle University critically evaluated articles using standardized forms (frameworks) and presented their evaluations to peers at meetings (5,9,26). There have been experiences in which the questions were formulated by the coordinator/advisor as a guide to the evaluation and quality of the articles (24). Finally, there were also two reported groups that established, as a mandatory requirement, that the article discussed should be a randomized clinical trial (12,26).

5. Pedagogical choices:

Regarding the coordination methodology, more than half of the studies analyzed distributed the selected article to the group in advance (1,4,6,7,20,21,22,24,29). Most articles reported the involvement of a faculty tutor or instructor who helped select texts, guided discussions, and formulated key questions for the debate (4,6,9,19,20,22,25,26,29). A widely applied coordination model, with occasional modifications based on the group's objectives, involved a three-step process: prior selection of an article (guided by a tutor), followed by its critical assessment, and a final presentation to the group (12,22). Finally, one study reported a model that assigned specific roles and responsibilities to each participant, including leaders (for organization and administration of the Journal Club), a chair (to ensure the meeting runs smoothly), a presenter, a rapporteur, and an administrator (5).

6. Evaluation methods:

Significant heterogeneity also exists in the evaluation methods used for Journal Clubs. The most frequently reported method was the use of questionnaires, with variations in administration timing. These included forms completed immediately

before and/or after the sessions (7,12,26), questionnaires sent via email to assess participants' confidence in their critical appraisal skills (20), and self-assessment formats using a 5-point scale to gauge the perceived relevance of articles to clinical practice (28). Longer-term evaluations were also reported, conducted at time points such as 8 weeks (26), 2 years (24), or even up to 6 years (1).

One journal club utilized an online research platform for evaluation. This study employed a Likert scale and multiple-choice questions to compare the face-to-face versus online formats and to gather participants' opinions regarding the functioning of the Journal Club for future planning (3). Other evaluation methods adopted in JCs included analyzing the number of articles published by group participants during the period in which the activities were taking place (29), and informal discussions about how, after engaging in the Journal Club, participants applied the literature in their medical practice (13,17).

Some studies reported using multiple evaluation methods in the same journal club, including informal discussions at the end of the module (equivalent to 4 sessions), internal feedback questionnaires, a formal questionnaire, and the number of letters written, sent, and published in journals and on the Internet (9). Another example combined informal feedback from both participants and supervising teachers with a formal evaluation of each participant's performance by the teachers during the JC sessions (6).

7. Positive points:

The literature review suggests that Journal Club participants have improved their interpretation of results, reading habits, and understanding of statistics (26) and epidemiology (15). In addition, they showed greater confidence in leading discussion groups and increased both the quality of oral summaries (4) and the practice of searching for scientific information in databases (7). They also demonstrated development in the ability to critically evaluate the literature, increased knowledge in thematic areas, and the ability to apply evidence in clinical contexts, positively influencing practical educational training (1,6,14).

Other studies have indicated that journal clubs are an important tool for improving debating skills, fostering leadership skills, and providing peer mentoring,

thereby promoting shared learning among participants. They are also considered an efficient method for continuous professional and technical development (5). For example, the Journal Club model reported by Haber, which applied various test models at different times during the activity, resulted in high participation from undergraduates and the formation of a team that placed among the top 40 at the national level in the American College of Clinical Pharmacy (ACCP) Clinical Research Challenge competition. In addition, the JC exams encouraged the complete reading of studies, extensive discussions among students, and active engagement during journal club presentations (13).

Journal clubs that utilized the "letters to the editor" model received positive feedback from both tutors and students, as the writing practice improved participants' ability to write more clearly and concisely for a specific target audience (9). Furthermore, the use of this method led to high levels of engagement, with members reporting that having several letters accepted for publication they felt encouraged to initiate their own research projects (29).

8. Negative points:

Negative points were also reported, often depending on the style of article chosen for debate and the methodology used in the Journal Club. Among the literature analyzed, a frequently cited problem was ensuring consistent attendance (1,20,22,25,28). One study highlighted a stark contrast between formats: in a comparison of two groups, the face-to-face group showed high attendance, with 96% of participants completing at least one module (equivalent to four sessions) of the eight planned. In the group mediated remotely via the Internet, this figure was only 18% (19). A lack of time, both to read articles beforehand (26) and to attend the meetings (5,13,29), was another frequently raised issue. In one case, meetings of approximately 25-minutes were also considered too short, and it was suggested that the duration should be increased to one hour (6).

Participants' limited clinical experience was cited as an obstacle for Journal Clubs (29) and was linked to passive behavior in discussions (24) and a source of frustration for some students (7). Difficulties in understanding concepts related to critical appraisal

skills (5), research methods, statistics, and evidence-based medicine (24) were also noted. In one study, the absence of a structured article review checklist reportedly hindered students' critical evaluation (1).

For online Journal Clubs, it was noted that interaction can be limited and participants can feel isolated. Therefore, the facilitator/session leader needs to be aware of this potential isolation, as well as the lack of non-verbal communication, and prepare strategies to actively include participants (3). Studies of Journal Clubs that transitioned from face-to-face to online meetings described that some students struggled with this change with regard to preparing for their presentations and creating a dynamic and interactive discussion (21).

Some surprising negative findings were the lack of perceived improvement in critical appraisal and writing skills of Journal Club participants, a criterion that was measured by the grade that undergraduate students achieved in their literature reviews (9). The dissatisfaction of some Chinese participants with their performance in interpreting statistics and, as non-native English speakers, with the language barrier was also been described (29). When a Journal Club was implemented as a compulsory component of a research methodology course, it reportedly failed to produce a positive change in the participants' reading habits, and even decreased the likelihood of professionals participating in a JC in the future (7).

9.How do we plan to structure our JC based on the reviewed literature?

After a consensus meeting among the PET group members and a discussion of the variables reviewed in the literature on the topics mentioned above, the proposed structure for the Journal Club (JC) within the UFPR Dentistry course is outlined below.

The concept of a journal club is not new, although these groups have been referenced for over a century, they are still rarely reported in undergraduate dentistry programs. To address this gap, the PET Dentistry group at UFPR proposed the creation of the first regular, structured journal club within the university's Dentistry course. The primary motivation was the group’s recognition of the need to continuously support the extracurricular academic development of its members and other students within the program.

After the research findings were gathered and discussed, the chosen format

consisted of 1-hour meetings held monthly, in accordance with the academic calendar. The meetings would be open to the public, with free-choice topics, provided they related to clinical practice. A monthly schedule would be prepared, in which two fellows were responsible for selecting and presenting a recent, high-impact article published in English, as well as moderating the discussion during the meeting. This would take place under the supervision of the program tutor and a professional guest with expertise in the selected topic.

Additionally, two other members would be responsible for sharing the chosen article with participants one week in advance for reading, and for promoting the event through the program social media channels. Each meeting would begin with a 20 to 30-minute presentation on the article, supported by slides prepared in English. The presentation would be followed by an open debate, encouraging the free exchange of ideas, questions, and critiques regarding both the study and the topic discussed.

At the end of each session, a feedback form would be distributed to participants, aiming to gather insights about their experience in the activity and to support the organizers in evaluating and proposing improvements for future editions.

DISCUSSION

Among the articles analyzed, 19 address the structure of a Journal Club (JC). The earliest report dates from 2001, and the most recent from 2021. The most frequently cited issue was the low face-to-face participation of undergraduate, postgraduate, and residency students (1,20,22,25,28). Consequently, it was decided that meetings would be held online to ensure greater participation in the activity. Another concern raised was the lack of time both to read the articles beforehand (26) and to attend the meetings (5,13,29). Therefore, it was established that the selected article should be made available one week in advance via a link on Instagram for prior reading, and that the time saved by eliminating travel in the online format could be used to read the article.

Some authors report the implementation of Journal Clubs restricted to specific groups (3,4,6,7,9,12,19,24,29). Regarding the number of participants in JC meetings, the literature indicates that a group size of up to 20 participants, similar to what is found here, is more favorable for interaction during sessions (1,3,9,28). The PET group has the

permanent participation of 13 members—PET scholarship holders and a tutor—who would be involved in the activity, in addition to the invited professional. It is also expected that, initially, undergraduate students outside the PET group will participate, with attendance increasing as the JC becomes more popular.

Meetings would be held monthly, allowing all group members to organize themselves and participate in the Journal Clubs. Most authors do not mention the duration of meetings (2,3,5,6,7,9,12,25,28,29). Among those who specify meeting length, sessions around 25 minutes were considered too short, with a suggested duration of one hour (6), which was thus adopted. Additionally, the meeting length would be disclosed in advance so participants could plan accordingly. Reports of online Journal Clubs (3) noted limited participant interaction. For this reason, the “host” not only presents but also moderates the discussion and implements strategies to encourage verbal communication and inclusion among attendees. Furthermore, an expert on the topic would be invited to address participants' questions about the subject or the publication process, fostering dialogue and knowledge exchange.

According to findings in the literature, participants in Journal Clubs improve their ability to interpret results, develop better reading habits, and enhance their understanding of statistics (26) and epidemiology (15). Additionally, they demonstrate greater confidence in leading discussion groups and show improvements in the quality of oral summaries (4) as well as in the practice of searching scientific information in databases (7). They also develop critical evaluation skills, expand knowledge in thematic areas, and strengthen their ability to apply evidence in clinical contexts, positively impacting practical educational training (1,6,14). These benefits are expected for participants in the Journal Club structured by PET.

Another relevant point concerns the capacity of Journal Clubs to bolster students’ confidence in critically appraising scientific literature. In the study by (10), participation in multiple Journal Club sessions led to a marked increase in students’ self-assessed confidence when evaluating clinical trials. This finding aligns with systematic reviews demonstrating that well-structured Journal Clubs are highly effective educational tools for developing critical analysis skills. By setting clear learning objectives, employing targeted didactic strategies, and ensuring expert facilitation,

Journal Clubs create a supportive environment in which learners progressively build both competence and assurance in their ability to dissect and interpret complex research findings.

Furthermore, integrating opportunities for direct interaction with clinical specialists within Journal Club meetings can significantly enhance engagement and deepen the relevance of discussions. When students can pose questions to experienced practitioners and receive feedback from them, reflective debate flourishes and bridges the gap between theoretical knowledge and real-world application. Such collaborative exchanges not only promote active learning but also foster a culture of continuous reading and evidence-based reasoning (5). Therefore, the planned PET Group Journal Club, with its emphasis on structured objectives, expert mediation, and specialist participation, is expected not only to strengthen participants' critical appraisal capabilities but also to cultivate enduring habits of scholarly inquiry and clinically grounded decision-making in dentistry.

Other studies have indicated the journal club as an important tool for improving debating skills, highlighting leadership skills, and providing peer mentoring, thus promoting shared learning among academics. It is also an efficient way to continuously develop professionally and technically (5). It is intended that these skills be observed in JC participants, including, for example, membership in academic leagues, scientific initiations, extension projects, and favorable academic performances, concomitantly with the journal meetings, implying activities that add to the students' learning and experience. Student presenters would be instructed to choose topics from the journal that they had affinity with or questions about, and to invite professors with whom they had a future goal of working, whether in an academic tutorial or scientific initiation, with the JC being a possibility for primary interaction between student and expert.

In order to reliably assess the efficiency of the Journal Club, the insertion of evaluative methods is recommended. In addition, it is suggested that this practice be turned into a research project and that this structure be put into practice in order to obtain answers about the functioning and need for improvements in the execution of the Journal Club.

CONCLUSION

After examining and synthesizing findings from twenty-eight studies, several key factors emerge for designing an effective Journal Club. First, limiting the number of participants encourages richer and more focused discussions, as larger groups often struggle to engage all members fully. Meetings lasting between forty-five minutes and one hour appear optimal; sessions shorter than this may not allow sufficient depth, while longer gatherings can reduce concentration and enthusiasm. Regular scheduling—whether weekly or monthly—helps establish a routine without overwhelming participants' other commitments. Furthermore, involving an experienced facilitator to select articles and guide discussions ensures that conversations remain relevant and pedagogically sound. Finally, choosing topics aligned with learners' current courses and professional interests enhances motivation and active participation.

Beyond its role within formal coursework, a Journal Club can serve as a valuable extracurricular opportunity, particularly for students in health-related fields. By immersing learners in primary scientific literature, this format fosters critical thinking skills and promotes evidence-based reasoning. Participants gain practical insights that bridge theoretical concepts with real-world practice, laying the foundation for continuous professional development. In this way, a well-organized Journal Club not only strengthens analytical abilities but also nurtures a culture of lifelong learning and scholarly engagement.

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TABLE 1

	Group Size						Academic Role						Frequency					Number of sessions					Participation Access			Duration			
Authors	**Up to 10**	**11 – 20**	**21 – 30**	**31 – 40**	**+ 150**	**Not reported**	**Undergraduate**	**Graduated (enrolled)**	**Residents**	**Graduates**	**Professors**	**Not reported**	**Weekly**	**Monthly**	**Biweekly**	**Other**	**Not reported**	**Up to 4 sessions**	**6 s sessions**	**8 sessions**	**More than 25**	**Not reported**	**Closed**	**Open**	**Not reported**	**< 1 hour**	**1 hour**	**> 1 hour**	**Not reported**
EDWARDS *et al.*, 2001		**X**					**X**						**X**					**X**					**X**				**X**		
AKHUND; KADIR, 2006		X							X				X									X		X		X		
SHAHI; NAVARRO; QUACH, 2006						**X**	**X**	**X**							**X**							**X**		**X**					**X**
MCLEOD *et al.*, 2010					X				X					X								X	X					X
SÁNCHEZ-MENDIOLA *et al.*, 2015						**X**			**X**	**X**				**X**							**X**			**X**			**X**		
SZUCS; BENSON; HANEMAN, 2017			X				X										X					X			X			
YU *et al.*, 2017			**X**					**X**	**X**	**X**			**X**									**X**	**X**						**X**
PARHAR; GIBSON, 2017				X			X							X					X				X					X
WENKE *et al.*, 2018		**X**								**X**				**X**					**X**				**X**				**X**		
DIAZ; WALSH, 2018;				X			X									X				X			X						X
MEZGEBE; CHESSON; THURSTON, 2019						**X**	**X**		**X**		**X**					**X**		**X**						**X**			**X**		
GURNEY *et al.*,2019				X			X						X								X		X				X		
BIMCZOK; GRAVES, 2020	**X**							**X**					**X**								**X**		**X**				**X**		
COLE *et al.*, 2020	X						X		X					X								X	X						
IANNO *et al.*, 2020						**X**	**X**										**X**					**X**			**X**				**X**
COGHILL, 2020						X						X					X					X		X					X
OXFORD; JORCYK, 2020						**X**	**X**	**X**			**X**		**X**							**X**			**X**							**X**
AULAKH; DUGGAL; SUTTON, 2020		X						X					X	X								X							X
HABER, 2021					**X**		**X**										**X**					**X**							**X**