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The Use of Pharmacology-Focused Journal Clubs in Health Sciences Education: A Descriptive Study

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Introduction: Physicians and nurses have a responsibility to provide evidence-based care to patients, which requires continuing education. The journal club model is an educational and collaborative tool widely used in healthcare for this purpose. However, further studies investigating the effectiveness and perception of participants are needed. The aim of this study is to explore the experience of medical and nursing students with the journal club approach applied to the subject of pharmacology.

Methods: Journal club sessions were developed within the pharmacology class of the medical and nursing degrees during the academic year 2023–2024. A total of 208 students participated in the study. 90 students (43.3%) were enrolled in the nursing degree course, while 118 (56.7%) were enrolled in the medical degree course. Students' perceptions were assessed through a qualitative questionnaire of 30 questions with 3 options.

Results: This study validated that this format is effective as a learning model, enhancing educational competences and non-educational competences required in health professionals. Our results showed the good acceptance of this format.

Conclusion: It is concluded that the journal club strategy enhances the educational and non-educational skills necessary for doctors and nurses to develop the competencies required in today's world.

Keywords: evidence-based practice, journal club, health professional competencies, SDG4: quality education, higher education

Introduction

Healthcare professionals, especially physicians and nurses, have a responsibility to provide evidence-based care to patients.[1] Since these tasks require reliable scientific evidence and scientific knowledge advances rapidly, these professionals must engage in continuous learning to improve and update their skills with the latest information. Continuing education of these professionals is not only the responsibility of the organisations providing care, but also of those providing training in the healthcare environment.[2–6] Therefore, both doctors and nurses must acquire knowledge and develop skills to comprehensively assess patients, make and/or implement clinical decisions and reflect on the results obtained.

Journal club methodology is an educational and collaborative tool used in healthcare and academia to promote continuous learning and updating on new scientific findings.[2] It consists of sessions in which a group of healthcare professionals or students meet to discuss and analyse scientific articles. Although journal club sessions are considered standard practice in the postgraduate stage for healthcare professionals, access to them is limited for healthcare students in pre-clerkship education, as they are not as frequently utilized (1). This educational strategy enhances various competences. Participants develop the ability to critically evaluate the quality and relevance of scientific studies, the competence to read, interpret and understand complex scientific articles, and foster autonomy in learning, teamwork, communication and synthesis skills. In addition, it improves non-educational capacities such as interpersonal abilities, time management, decision-making, adaptability, motivation and professional confidence.[7–10] All these educational and

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non-educational skills are essential for the continuous and holistic development of healthcare professionals, improving the quality of care provided and their overall well-being. However, there are drawbacks that hinder the benefits of journal club sessions. Lack of clear criteria for article selection, unequal participation of all members, time constraints, and differences in the level of knowledge and experience among participants may limit the effectiveness of the journal club.[6,11,12] To demonstrate the effectiveness of this strategy, studies are needed to comprehensively assess users' perception of this method.

In this study we aimed to explore the experience of medical and nursing students with the journal club educational model applied to the area of pharmacology.

Materials And Methods

Research Design Framework and Participants

The context of the journal club session was framed within the pharmacology subject studied in the second year of the medical and nursing degrees at the University of Salamanca. All participants were in their second year of medical or nursing school, and none had previously received pharmacology-related instruction. These university degrees were selected as representative examples of the field of health sciences. A descriptive study design was carried out. A total of 208 students enrolled in the pharmacology course during the academic year 2023–2024 participated in the study. The sample size was calculated using Cochrane´s formula for a confidence level of 95%. Of these, 90 students (43.3%) were enrolled in the nursing degree course, while 118 (56.7%) were enrolled in the medical degree course. At the beginning of the academic year, the students were informed about the structure of a journal club session, its purpose, and the potential benefits it could have on their professional training. All students agreed to participate in the sessions, as they considered them beneficial to their learning outcomes.

Implementation of the Journal Club Intervention in Nursing and Medical Students

The topics chosen for the different journal club sessions were research or review papers related to the content of the subject of pharmacology. The difficulty level of each paper was intended to be similar and was determined by two experienced pharmacology professors. The students were arranged into groups of 10–15 people to encourage social relationships between the different classmates. The groups for the different sessions were formed by students pursuing the same university degree. Subsequently, one article was assigned randomly to each group.

After the distribution of the various articles, the students had to individually work on and prepare the article assigned to their group. Additionally, they were required to create an individual PowerPoint presentation summarizing the different parts compiled in the article. They were also encouraged to make critiques and expose them in their presentations. Since most of the students had never been confronted with reading and critiquing a scientific article before, they were given guidelines on how to read and analyse a scientific article.

On the day of the journal club session, two groups participated, each presenting one article. The students of each group met together for 30 minutes to share what they had learned from their critical reading of the scientific article, thus encouraging teamwork. During this time, the different students helped each other to clarify different concepts of the assigned article and to reflect on the different criticisms raised during the individual part. They also created a joint PowerPoint presentation using parts of the individual ones from the students and ideas collected within the group. A maximum of four students were randomly selected to give the oral presentation of the scientific article. In addition, during these 30 minutes, different professor of the pharmacology course supervised and encouraged reflection on different points related to each article to further enhance critical thinking. The evaluators were pharmacology professors with diverse academic backgrounds, including biology, biochemistry, and medicine.

After this time, the selected members of each group exposed for 20 minutes the PowerPoint presentation. To capture and ensure the attention of all the students, during the time of the presenting group, the other students were invited to ask questions to their peers, as well as to solve others posed by the different professors during a turn assigned to them. In this way, the aim was to increase knowledge about the different topics raised in each article.

This was followed by a 15-minute discussion to secure and evaluate the different knowledge learned from each scientific article, as well as to enhance the reciprocal criticism of the working groups.

Finally, at the end of the Journal Club sessions, participants discussed how they could apply the knowledge they had learned to their clinical practice or what new perspectives they had gained.

Data Collection

Data were collected between January and March 2024. To assess the learning and use of the knowledge acquired during the different sessions of the journal club, we collected data from the students by means of a questionnaire. This was based on a previously developed paper, which was tested with modifications for this study (2,3).

The questionnaire consisted of 30 questions. Some questions focused on demographic aspects of the participants (age, gender, educational level such as bachelor's, master's, or doctoral degree), self-training in reading scientific articles, and frequency of reading scientific articles. Additionally, questions related to both educational and non-educational skills were collected. A qualitative 3-choice scale was used to answer the different questions ("to a great extent", "to a small extent" or "not at all"). Data were collected at the end of each journal club session. In addition, a satisfaction survey was administered to individual students.

Statistical Analysis

The collected data were analysed using the statistical software SPSS Statistics 26.0. As this study was mainly descriptive, descriptive information was presented using numerical data analysis (absolute number of responses and proportion, n (%)).

Ethical Considerations

In accordance with Spanish regulations, ethical approval was not necessary, as this research did not violate the integrity of the participants, and their data were not used without their prior informed consent. The privacy, humanity and voluntariness of the participants were considered. The results of the surveys were completely anonymous.[13,14]

Results

Description of the Participants

Of the 208 students who participated in the study, 90 (43.3%) were studying nursing, while 118 (56.7%) were studying medicine. Most of the students (n=196, 94.2%) were aged 18–22 years. However, 7 (3.4%) were between 23 and 28 years old, 2 (1.0%) between 28 and 33 years old and 3 students (1.4%) were older than 33 years old. In terms of gender distribution, 149 (71.6%) students were female, while 59 (28.4%) were male. Most students (n=175, 84.1%) did not usually read scientific articles. However, 142 (68.3%) participants felt able to critically read scientific articles.

Students' Perception That the Journal Club Methodology Improves Educational Competences

The majority of students (n=187, 89.9%) stated that the journal club methodology is a very effective learning strategy. In addition, most participants considered that this educational methodology improves their health science research skills (n=176, 84.6%), keeps them updated on the latest developments in their area of interest (n=195, 93.8%), develops their critical thinking and strengthens their understanding of evidence-based practices (n=178, 85.6%). In terms of practical skills, students felt that this methodology contributes positively to their ability to understand and apply new techniques and procedures (n=176, 84.6%), to make informed decisions in clinical situations (n=169, 81.3%) and to develop their clinical judgement and diagnostic reasoning (n=183, 88.0%). Among other educational competencies collected, overall, the majority of students (n=176, 86.1%) acknowledged that this educational approach largely complements their academic training (Table 1).

Table 1 Development of Educational Skills From Journal Club Sessions (n=208)

From Participation in the Journal Clubs, I Consider this Educational Methodology:	To a Great Extent n (%)	To a Small Extent n (%)	Not at All n (%)
Is effective as a learning strategy	187 (89.9)	0 (0.0)	21 (10.1)
Improves my health sciences research skills	176 (84.6)	31 (14.9)	1 (0.5)
Keeps me up to date on advances in the health sciences	195 (93.8)	11 (5.3)	2 (1.0)
Develops my critical thinking	178 (85.6)	28 (13.5)	2 (1.0)
Strengthens the understanding of evidence-based practices.	178 (85.6)	29 (13.9)	1 (0.5)
Positively affects my ability to understand and apply new techniques and procedures.	176 (84.6)	29 (13.9)	3 (1.4)
Improves my ability to make informed decisions in clinical situations.	169 (81.3)	37 (17.8)	2 (1.0)
Develops my clinical judgment and diagnostic reasoning	183 (88.0)	24 (11.5)	1 (0.5)
Promotes innovation and the adoption of best practices in the healthcare field	180 (86.5)	28 (13.5)	0 (0.0)
Influences my interest in health sciences research as a potential area of specialization	117 (56.3)	66 (31.7)	25 (12.0)
Positively impacts my motivation and commitment to continuous learning in health sciences.	143 (68.8)	57 (27.4)	8 (3.8)
Contributes to my professional development	180 (86.5)	25 (12.0)	3 (1.4)
Helps me to understand and address current challenges and issues.	163 (78.4)	44 (21.2)	1 (0.5)
Complements my academic training	176 (86.1)	27 (13.0)	2 (1.0)
Enhances my skill to communicate effectively with other health care professionals	146 (70.2)	54 (26.0)	8 (3.8)
Reinforces my ability to be an informed advocate for the health and well-being of patients	182 (87.5)	24 (11.5)	2 (1.0)
Improves ability to interpret and understand statistical concepts	143 (68.8)	52 (25.0)	13 (6.3)
Contributes to the translation of information from a scientific article to clinical practice	136 (65.4)	63 (30.3)	9 (4.3)
Enhances my ability to disseminate scientific information	150 (72.1)	53 (25.5)	5 (2.4)

Students' Perception of Non-Educational Competences Enhanced by the Journal Club Methodology

In addition to assessing students' perceptions of the educational skills affected by the Journal Club methodology, non-educational skills were also assessed. Most students (approximately 70–73%) recognized that this pedagogical approach contributes to fostering critical thinking not only in the health field, but in general. They also considered that it contributes very positively to their coping and problem-solving skills, as well as enhancing intellectual curiosity and motivation in general. However, students disagreed about the contribution of journal clubs to the development of patience and time management (Table 2).

Students' Satisfaction With the Journal Club Sessions

To assess the degree of students' satisfaction during the implementation of this educational strategy, a satisfaction survey was conducted. Most students enjoyed the sessions, finding them useful and even recommending them for subsequent years. In addition, only 71 students (34.1%) found the journal club sessions difficult (Table 3).

Table 2 Development of Non-Educational Skills From Journal Club Sessions (n=208)

From Participation in the Journal Clubs, I Consider this Educational Methodology:	To a Great Extent n (%)	To a Small Extent n (%)	Not at All n (%)
Encourage my critical thinking in non-healthcare settings	152 (73.1)	49 (23.6)	7 (3.4)
Contributes to my ability to face and solve different problems	147 (70.7)	53 (25.5)	8 (3.8)
Promotes my intellectual curiosity and motivation	152 (73.1)	47 (22.6)	9 (4.3)
Develops my patience	84 (40.4)	91 (43.8)	33 (15.9)
Improves my time management skills	65 (31.3)	106 (51.0)	37 (17.8)

Table 3 Satisfaction Degree of Students With Journal Club Sessions (n=208)

Questions	To a Great Extent n (%)	To a Small Extent n (%)	Not at All n (%)
Did you enjoy the journal clubs session?	129 (62.0)	65 (31.3)	14 (6.7)
Do you recommend this session for future years?	144 (69.2)	47 (22.6)	17 (8.2)
Did you find it difficult?	71 (34.1)	119 (57.2)	18 (8.7)
Did you find it useful?	160 (76.9)	39 (18.8)	9 (4.3)

Discussion

"Quality education" is one of the seventeen Sustainable Development Goals (SDGs) of the United Nations 2030 Agenda. This objective aims to provide high-quality, accessible and equitable education to the entire population, reinforcing continuous learning throughout life [20,21].

Healthcare professionals, including doctors and nurses, need up-to-date knowledge to provide the best evidence-based care. Therefore, continuous learning is necessary to reinforce and develop the competencies required in current clinical practice.[1–5] The journal club strategy has been suggested as an effective educational methodology to enhance lifelong learning.[2] Currently, this format is widely used in the healthcare field to keep professionals up to date with the latest advances in research and clinical practice.[1,12,15,16]

In this study we wanted to explore the experience of medical and nursing students with the journal club model applied to the area of pharmacology.

The participants expressed that this educational approach allows them to stay up-to-date and even implement relevant findings into their clinical practice. These findings are consistent with other studies.[3,11]

This methodology offers numerous benefits to their participants. These advantages largely stem from the pedagogical structure of the sessions and the critical discussion of different scientific articles.[7,17] The benefits observed in this study are consistent with those previously described. One significant benefit is the development of critical thinking, as participants in journal club sessions enhance their critical thinking skills by discussing the diverse perspectives of the attendees.[8] Students express that this educational model enhances critical thinking both at an educational level and in general. Furthermore, the collaborative environment of this methodology improves communication, presentation and teamwork abilities.[7,17,24] In this study, participants considered that these capacities are developed with this learning model. Furthermore, this educational strategy is well accepted by students.

Despite the many curricular advantages of the journal model, factors such as lack of clear criteria for article selection, unequal member participation, and time constraints could decrease the effectiveness of the sessions.[6,11,12] In this study, as the sessions were framed within the topic of pharmacology, the effects of the article selection criteria were mitigated by being restricted to a very specific area. Furthermore, the individual preparation of a Power point presentation as well as the management of the discussion conducted in this study ensured that the participation of all members was equitable However, the time efficiency constraint was not overcome, which may explain why students indicated that this approach did not improve their time management skills.

This study presents some limitations and opens future recommendations. Since the purpose of this study was to explore medical and nursing students' experiences with the journal club model, their perceptions were assessed using a semi-structured survey adapted for this purpose. More quantitative research, such as a pre/post comparison, is needed to assess the effects of journal clubs. The groups in the different sessions were not interprofessional, and it would be valuable to develop future sessions with interprofessional groups to benefit from the feedback of different professionals. Another limitation of this study is that perception was only assessed at the end of the journal club session, and it might be interesting to assess perception at some point after the session, where these participants were able to apply the new knowledge learned. However, we consider that showing the perception of these participants could serve as a starting point for future research.

Finally, it should be noted that the journal club model is increasingly implemented in the continuing education required in the healthcare field and studies such as this one supports it (4–8). Therefore, the competencies that healthcare

professionals acquire from this educational methodology will have a clear impact on their professional training and, consequently, a positive impact on society.

Conclusion

We can reason that this educational strategy enhances educational skills (knowledge updating, continuous training, communication skills.) and non-educational skills (general critical thinking, ability to face and solve problems, motivation.) necessary for nurses and physicians to develop the competencies required by today's world.

Furthermore, this study leads us to conclude that the journal club model is an effective learning methodology that is well accepted by students. However, further studies are needed, as well as the extension of this educational approach to other areas of knowledge to exploit its benefits and adjust the limitations that hinder its effectiveness.

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Author Contributions

All authors made significant contributions to the work reported, whether in conception, study design, execution, data acquisition, analysis, interpretation, or all these areas. They participated in drafting, revising, or critically reviewing the article; gave final approval of the version to be published; agreed on the journal to which the article was submitted; and accepted accountability for all aspects of the work.

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Disclosure

The authors declare no conflicts of interest in this work.

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