



Review

Exploring the impact of using cinema and TV series in medical education: a systematic review

Joel Piqué-Buisan^{a,b,c}, Erika Sorribes^d and Irene Cambra-Badii^{a,b,e,*}^a Chair of Medical Education, Faculty of Medicine, Universitat de Vic – Universitat Central de Catalunya, Vic, Spain^b Institute for Research and Innovation in Life Sciences and Health in Central Catalonia (IRIS-CC), Vic, Spain^c Observatory of Humanities in Medicine, Hospital d'Olot i Comarcal de la Garrotxa Foundation, Olot, Spain^d Institut El Til·ler, Les Franqueses del Vallès, Spain^e Research group on Methodology, Methods, Models and Outcomes of Health and Social Sciences (M₃O), Faculty of Health Sciences and Welfare, Center for Health and Social Care Research (CESS), Universitat de Vic – Universitat Central de Catalunya, Vic, Spain

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A B S T R A C T

Using featured films and TV series as pedagogical tools in medical education has recently surged in popularity. This paper presents a systematic review evaluating their pedagogical applications and analyzing expertise in this field. A total of 17 papers, spanning from 1983 to 2023, were comprehensively analyzed. Results were categorized by original journal, themes, population characteristics, target groups, specific films/series used, instructional methods, and outcomes. Diverse topics emerged, including medical professionalism, bioethics, and critical thinking. 2871 medical students participated in these experiences, mainly from the first- or second year. Most experiences relied solely on films. Articles highlighted the importance of debates around audiovisual materials. The review found featured films and TV series to be valuable supplements to traditional medical education. They enrich students' learning experiences, deepen engagement with complex subjects, and foster critical skills development, offering an innovative teaching approach.

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Explorando el impacto del uso del cine y las series de televisión en la educación médica: una revisión sistemática

R E S U M E N

El uso de películas comerciales y series de televisión como herramientas pedagógicas en la educación médica ha ido en aumento. En este artículo se presenta una revisión sistemática que evalúa sus aplicaciones pedagógicas y analiza las experiencias realizadas en este campo. Se analizaron de manera exhaustiva un total de 17 artículos publicados desde 1983 hasta 2023. Los resultados se categorizaron según la revista de publicación original, los temas tratados en las sesiones pedagógicas, las características de la población, los grupos objetivo, las películas/series utilizadas, los métodos pedagógicos y los resultados obtenidos. Los temas u objetivos más tratados en la educación médica con cine y series incluyeron el profesionalismo, la bioética y el pensamiento crítico. En estas experiencias participaron 2.871 estudiantes de medicina, en su mayoría del primer o segundo año. La mayoría de las experiencias se basaron exclusivamente en películas. Los artículos destacaron la importancia de los debates en torno a los materiales audiovisuales. La revisión encontró que las películas comerciales y las series de televisión son valiosos complementos para la educación médica tradicional, ya que enriquecen las experiencias de aprendizaje de los estudiantes, profundizan el compromiso con temas complejos y fomentan el desarrollo de habilidades críticas, ofreciendo un enfoque de enseñanza innovador.

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* Corresponding author.

E-mail address: irene.cambra@uvic.cat (I. Cambra-Badii).

Introduction

The utilization of audiovisual fiction in higher education, particularly within the field of medical education, is experiencing a growing trend. While its adoption has seen a notable increase in recent years,^{1–4} it is worth noting that this approach is not entirely novel. In fact, the earliest documented instance of incorporating films into medical education dates back to 1979, when a seminar on psychiatry integrated this medium.⁵ Since that pioneering initiative, fictional audiovisual materials have found application across various domains, encompassing not only the development of transversal skills like communication and professionalism,^{6–8} but also more specialized disciplines such as pharmacology,⁹ or psychology.¹⁰

For years, feature films have been an integral part of our daily lives. Yet, in the last decade, American-produced TV series have witnessed a remarkable and ever-growing worldwide viewership surge. This phenomenon can be attributed to the emergence of streaming platforms such as Netflix, HBO, and Amazon Prime, which collectively boast millions of subscribers. These platforms have liberated viewers from the constraints of traditional television channels, offering a diverse array of options on their television screens.^{11,12}

In university classrooms, the incorporation of audiovisual materials represents a departure from traditional educational methods, serving as a complementary and more engaging approach for students. Films, by their very nature, are adept at captivating viewers' attention and evoking a range of emotional responses.^{13–16} Through this medium, students can immerse themselves in the experiences of on-screen protagonists, allowing them to empathize without shouldering the actual clinical responsibilities.^{17,18}

The integration of films into medical education gave rise to the *cinemeducation* methodology. This term – a fusion of “cinema,” “medical,” and “education” – was coined in 1994 by Matthew Alexander.¹⁹ Since its inception, cinemeducation has evolved into a pedagogical strategy employed across various disciplines.²⁰ However, it remains a lack of systematic description and development of related activities within this educational framework.^{1,2,4}

Some previous reviews have explored the pedagogical use of fiction audiovisuals to provide an overview of the educational landscape.^{1,2,4} However, one of these reviews exclude TV series due to their contemporary nature,¹ and other one may have become outdated.² The most recent review available only considers American series up to 2015,⁴ highlighting the need for a fresh systematic search encompassing more recent developments.

The primary objective of this review is to analyze the current utilization of feature films and TV series in medical education. This analysis aims to support educators who are interested in exploring this field and incorporating innovative teaching methodologies. To achieve this goal, we have included studies in which educators share their experiences of using these audiovisual resources in medical education.

Methods

Search strategy

This systematic review was conducted in accordance with the PRISMA methodology.²¹ To execute this process, an extensive literature search pertaining to the utilization of films and TV series in medical education was undertaken, with the search period extending up to July 2023 and no initial date limit applied.

PubMed and Scopus were selected as the primary databases for sourcing relevant articles. PubMed was chosen due to its widely recognized status as a prominent biomedical literature database, while Scopus was included for its inclusion of articles published in Spanish, broadening the linguistic scope of the search. The following keywords were employed in the search: (“medical education” OR “teaching” OR

“education” OR “medical students” OR “medical”) AND (“cinemeducation” OR “cinema” OR “TV series” OR “TV films”). These keywords were searched within the article title, abstract, and/or keywords to ensure the pertinence of the identified literature to this study.

Inclusion and exclusion criteria for article selection

The articles included in this review were selected based on their alignment with the following selection criteria, while any articles that met the exclusion criteria were omitted.

Inclusion Criteria:

1. Articles must be scholarly, peer-reviewed research.
2. Articles must describe teaching experiences within the context of medical degree programs.
3. Articles must focus on teaching methodologies involving the use of commercial fictional films and/or TV series.

Exclusion Criteria:

1. Articles not fully accessible within the selected databases.
2. Articles lacking complete translations in English or Spanish.
3. Review articles.
4. Articles that conduct a content analysis of films and series to assess their educational potential but do not delve into the development of teaching experiences.

Analysis

Fig. 1 illustrates the process of study identification and selection conducted via PubMed and Scopus databases. Initially, each article underwent an initial review by 2 researchers, providing an initial overview of the study's content. Articles that described specific teaching experiences with students were subjected to qualitative analysis. This analysis sought to extract the following information from each article: the film and/or series used, the subject matter addressed, the number of participants, their academic degree and course of study, the methodology and instructional approach employed, and the assessment and outcomes resulting from the utilization of these audiovisual resources.

Results

In this review, a total of 17 articles were included (see Table 1). Among them, 10 incorporated the use of films in university classrooms, while 5 integrated TV series. The remaining 2 studies included both films and series in their methodology.

Journals

The diverse range of topics explored through audiovisual materials in university settings, across numerous countries, has resulted in the dissemination of related research across a wide spectrum of scientific journals spanning from 1983 to the present day. A total of 12 distinct journals were identified as venues for publishing the studies included. Notably, the majority of these studies were from *Academic Psychiatry* from Switzerland (5 articles), followed by *Medical Teacher* from the United Kingdom (2 articles).

Themes

A total of 12 distinct themes were explored through the use of films and series in the context of medical education. Some articles address the use of film and TV series in the development of transversal competencies, while others focus on medical disciplines.

Among the first group, professionalism, the cultivation of students' critical and moral reasoning emerged as prominent themes, collectively constituting 7 articles.^{6,22–27}

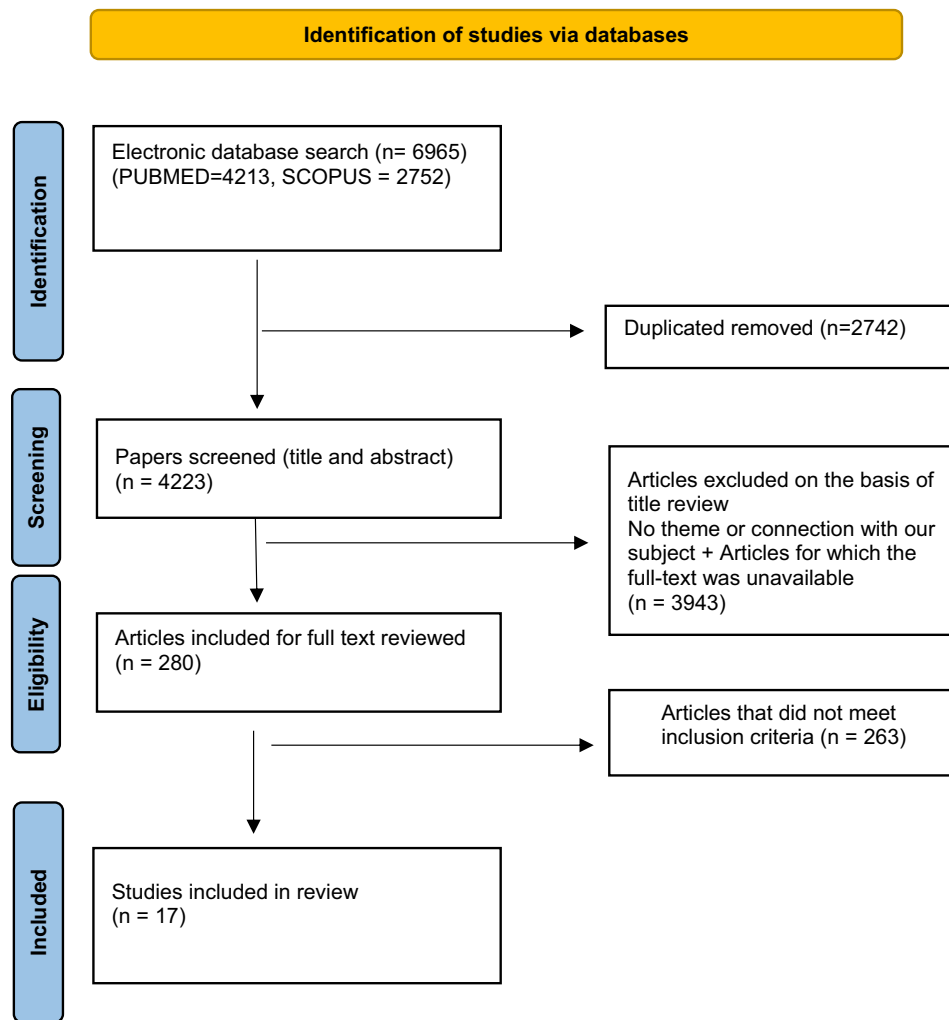


Fig. 1. Study selection flow diagram.

The second most prevalent topic addressed was psychiatry (5 articles), which encompassed various aspects, including the exploration of mental illnesses^{28–30} as well as their potential treatments.^{31,32}

The remaining publications delved into diverse topics, including forensic medicine,³³ pharmacology,⁹ human sexuality,³⁴ AIDS,³⁵ palliative care,³⁶ patient and family,³⁷ and diagnosis.²⁷

Population characteristics and target groups

In total, 2871 medical students participated across all the articles included in this review. The number of participants in each study exhibited considerable variation, ranging from as few as 8³² to as many as 1032 undergraduates.²⁸

These educational experiences were conducted in multiple countries, with the United States leading the way (7 articles), followed by Spain (2 articles) and Germany (2 articles).

The studies involved participants from various courses. Two of them did not specify the course in which the experience took place, while 3 were conducted within the same course for multiple years. First and second years were the most preferred courses for conducting these experiences, with 4 articles each.

Films and series

Experiences reported using 60 films and 6 television series, while it should be noted that 2 articles^{22,34} do not specify the films used.

Regarding films, the most frequently used titles, featured in 3 different studies each, were *Wit* (2001),^{24,25,36} and *When a Man Loves a Woman* (1994).^{28,30,37} Other commonly used titles included *Lorenzo's Oil* (1992), *Outbreak* (1995), and *Trainspotting* (1996).

Regarding TV series, the most frequently utilized was *ER* (1994), featured in 4 different experiences,^{6,23,31,32} followed by *In Treatment* (2008),³² *House MD*,²⁷ and *Grey's Anatomy* (2005–), *The good doctor* (2017–) and *Chicago Med* (2015–),²⁶ each employed in a single experience.

Out of these audiovisual materials, 6 articles involved the use of selected clips, while 11 employed entire films or TV series.

Pedagogical methodology

The incorporation of film and series into medical education has been executed through diverse methodologies.

These fictional audiovisual resources find their place within 2 primary formats: (1) as part of a workshop, subject, or elective course spanning several sessions during a term or semester – 10 articles,^{22–25,27,28,32–34,37} or (2) as a one-time seminar in a specific subject – 7 articles.^{6,9,26,29–31,36}

Eight studies adopt a common pedagogical structure for a 90-min or 2-h class.^{9,22,26,29,31–34} It commenced with an initial assessment to gauge students' foundational knowledge of the topic before intervention. Subsequently, teachers provided a brief 10–15 min introduction to the subject matter. Following this, the selected film or series is

Table 1
Study characteristics of experiences using films or series in medical education.

Author, year and Journal	City, Country	Theme	Population and target groups	Film/Series	Pedagogical methodology	Evaluation and results
Mandel 1983 <i>Medical Education</i>	Wisconsin, USA	Human sexuality: masturbation, homosexuality, psychosexual development of male and female and the meaning of touch	57 participants (course non-specified) 3 groups: - Film viewing + discussion workshop - Discussion-only workshop - Control group without film viewing nor discussion	Set of explicit sexual behavior films non-specified	- Pre- and post-intervention test 5 sessions which included film viewing and discussion, only discussion or neither of the previous ones	Knowledge scores showed a significant pre-to-post increase only in the film workshop although there was a change in attitude in both.
Self et al. 1993 <i>Academic Medicine</i>	Texas, USA	Development of Moral Reasoning	114 participants: First-year medical students 3 groups: - One-quarter exposure to film discussions (48) - Two-quarter exposure to film discussions (37) - Non-exposure (control) (29)	Set of films non-specified	1 or 2 workshops each trimester, which included: - Pre-intervention test - Films viewing - Discussion - Post-intervention test	Students' moral reasoning scores increased in a statistically significant way compared with the scores of the students of the control group. The differences in the scores between the workshops were not significant.
McNeilly et al. 2001 <i>Academic Psychiatry</i>	Nebraska, USA	Psychotherapeutic treatments	72 participants Third-year medical students	TV series: ER	Two 90 min-length seminars which included: Teacher introduction Pre-intervention test Clips viewing (11 selected clips) Discussion Post-intervention test (Likert-type scale questions to evaluate knowledge)	Comparison between pre- and post-seminar questionnaires show that students had acquired knowledge about the topic Positive personal reactions and enthusiasm for the experience.
Welsh 2003 <i>Academic Psychiatry</i>	Maryland, USA	Intoxication and Withdrawal Syndromes	89 participants Second-year medicine students	27 different films and TV shows such as <i>The X files</i> + Training film not commercially available	One seminar which included: 3 PowerPoint presentations about intoxication and withdrawal syndromes Clips viewing Post-intervention test (open-ended questions)	92% students found useful the use of the movies and TV shows and rated that they would remember the various intoxication and withdrawal syndromes
Weber et al. 2007 <i>Family Medicine</i>	Massachusetts, USA	Patient, Family and Illness	It does not provide the total number of participants Between 5 and 10 participants per year during 2 years 1st- and 2nd-year medical students	Films: Lorenzo's Oil The Straight Story A River Runs Through it Ordinary People The barbarian Invasions The Trip to Bountiful Marvin's Room Iris When a Man loves a Woman The Days of Wine and Roses Flawless My House in Umbria Beaches	10-weeks course, in which every other week students had to: - Watch 2 films home - Participate in a 2-h discussion session - Reflect in a weekly journal on the films - Written reflection on a film of their own choosing and do a 15-min presentation about it - Anonymous subjective survey to evaluate the course	Students realized about the impact on the families when they have an ill relative Students felt that the use of films helped them to understand different ways in which families deal with the emotional burden of illness
Lumlertgul et al. 2009 <i>Medical Teacher</i>	Bangkok, Thailand	Professionalism	26 participants Second-year medical students	Films: Patch Adams Awakenings Lorenzo's Oil The Death of Mr. Lazarescu TV series: ER (2 episodes)	5 sessions which included: Entire film and episodes viewing 1-h discussion led by 2 students Open-ended questionnaire to express opinions In the last session, participants explained what they liked and disliked and what did they learnt	Students stated that they developed their critical thinking and moral reasoning skills, were able to understand the impact of illness on patients and families and that were prepared to face situations which they would have to encounter in clinical years
Aboul-Fotouh	Texas, USA	Psychotherapeutic treatments	8 participants Third-year medical	Series:	6 one-hour sessions which included:	Students' knowledge of psychotherapy did not change

Table 1 (continued)

Author, year and Journal	City, Country	Theme	Population and target groups	Film/Series	Pedagogical methodology	Evaluation and results
et al. 2010 <i>Academic Psychiatry</i>			students	- ER - In Treatment	Pre-intervention test Clips viewing (one selected clip from each series) Role-plays Case examples Recording of therapy sessions Discussions Post-intervention test (multiple-choice questions to evaluate the knowledge and Likert-type scale questions to evaluate feedback)	significantly Students' self-rating of knowledge increased from 3.4 to 6 out of 10 after viewing the series
Klemenc-Ketis et al. 2011 <i>BMC Medical Education</i>	Maribor, Slovenia	Professionalism	11 participants Fourth-year medical students	Film: Wit	4 month-length program which included 2 sessions about the film: Lecture Film viewing Discussion Written essay Oral presentation	The evaluation was made through the identification, elaboration and reflection of the themes in the written assignments and oral presentations Teaching professionalism through the use of films is relevant and useful
Kuhnigk et al. 2012 <i>Academic Psychiatry</i>	Hamburg, Germany	Psychiatric illnesses	1032 participants medical students (course non-specified)	Films: Iris: A Memoir of Iris Murdoch Dark days When a Man loves a Woman A Beautiful Mind The White Sound Room 4070 As Good as It gets Me, My Friend, and I Joyride Secrets of a Soul Alone One Flew over the Cuckoo's Nest Film: Wit	3–4 seminars per trimester which included: Teacher introduction Film Viewing Discussion Short lecture Patient interview (the patient was suffering from the specific disease shown in the movie) Post-intervention test (open-ended questions to evaluate knowledge and Likert-type scale questions to evaluate feedback)	The movies helped students to put themselves in the position of a person suffering from a certain psychiatric disease. The cinemeducation seminar was considered to be useful.
Ozckir et al. 2014 <i>Journal of Palliative Medicine</i>	Bursa, Turkey	Palliative care	518 participants First-year medical students	Film: Wit	1 seminar which included: Short introduction about the study Film viewing Post-intervention test (open-ended questions to evaluate the film and Likert-type scale questions to evaluate feedback) Discussion Short presentation about palliative care	Satisfaction questionnaire 80.5% students found this learning approach more useful than didactic lectures and journal article readings but not more useful than bedside rounds
Retamero et al. 2014 <i>Academic Psychiatry</i>	North Carolina, USA	Suicide	180 participants Second-year medical students	Film: The Bridge	1 seminar which included: Hour-long conventional lecture Problem-based learning workshop with case discussion Pre-intervention test Film viewing Hour-long discussion Post-intervention test (Likert-type scale questions and written comments to evaluate feedback)	91.1% of the students disagreed that using films for education was a waste of time and 88.3% agreed that discussing the film reinforced concepts learned in the lecture
Shevell et al. 2015 <i>Medical Teacher</i>	Montreal, Canada	Professionalism	112 participants First-year medical students	TV series: ER	1 seminar which included: 12 selected clips were screened accompanied by written teaching guides Questions about each clip to encourage discussion Post-intervention test (open-ended questions to evaluate feedback)	Students reported they had thought about how they would or should act in similar situations and affirmed that an added benefit was sharing personal narratives from their own life experiences in the discussion.

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Table 1 (continued)

Author, year and Journal	City, Country	Theme	Population and target groups	Film/Series	Pedagogical methodology	Evaluation and results
Shankar et al. 2016 <i>Journal of Clinical and Diagnostic Research</i>	Aruba, Kingdom of the Netherlands	Communication skills, empathy, professionalism, and greater understanding of the process and death and dying	60 participants All-courses medicine students	Films: Wit The Doctor People Will Talk	A movie was screened every trimester, and at the end of each trimester, a 3-h seminar was conducted. Groups of 8 students presented their findings for 30 min, followed by a group discussion. At the end of the course, feedback from the students was collected through a questionnaire.	Student feedback was obtained and it was positive
Jerrentrup et al. 2018 <i>PLOS ONE</i>	Marburg, Germany	Diagnosis approach, rare diseases and bioethical issues	213 participants All-courses medicine students	TV Series: House MD	6–8 90-min seminars including: - 1st clip viewing: patient presentation - Discussion about the most probable diagnosis - 2nd clip viewing: side effects of the treatment - Discussion about patient safety aspects - 3rd clip viewing: final diagnosis - Post-intervention test (Likert-type scale, multiple choice and open-ended questions to evaluate feedback)	When compared with a traditional seminar, most of the students were more interested, higher motivated, more fun, more concentrated and they felt that they had learnt more Students felt that the lecturer was especially important to understand the content properly
Cambra-Badii et al. 2020 <i>European Journal of Clinical Pharmacology</i>	Barcelona, Spain	Pharmacovigilance and adverse drug reactions	237 participants - 3rd, 5th, and 6th-year medical students (170) - 3rd-year Human Biology students (38) - Pharmaceutical and biotechnology Master students (29)	Film: 150 Milligrams (<i>La fille de Brest</i>)	One seminar which included: Teacher introduction Pre-intervention test Film viewing (50 min length clip) Discussion and doubts Post-intervention test (multiple choice questions to evaluate knowledge and Likert-type scale questions to evaluate feedback)	The mean of correct answers was 1.37 points higher on the post-intervention assessment 76.3% students considered the debate valuable, 85.9% recognize the value of films in teaching activities and 95.9% would recommend this activity to other students
Cambra-Badii, et al. 2023 <i>International Journal of Education and Practice</i>	Barcelona, Spain	Bioethical issues related to the COVID-19 pandemic	63 students of fourth-year health sciences and humanities	TV series: Grey's Anatomy The Good Doctor Chicago Med	1 seminar which included: Teacher introduction Pre-intervention test Film viewing Discussion and doubts Post-intervention test	10-question multiple-choice questionnaire was administered before and after the activity. Scores in both groups were higher after the activity.
Soni et al. 2023 <i>Future of Medical Education Journal</i>	Palakkad, India	Forensic medicine	90 students Course not specified	Films: Agent Sai Srinivasa Atherya and Drishyam. Pink Autopsy of Jane Doe Patch Adams Awakenings Raja Rani	6 sessions were conducted. Random distribution into 2 groups (case-control) with subsequent crossover. Control group: Thematic explanation using the traditional method. Case group: Explanation using a video clips.	Evaluation via multiple-choice test. 15-day memory retention test was conducted for both groups to assess if movies clips helped in student learning and long-term memory retention

screened, followed by a discussion where students took a leading role, while the teacher assumed a secondary role. Post-intervention, a second assessment is administered, and the results are compared with the initial one to evaluate the learning outcomes. Finally, instructors offer a questionnaire to gather feedback on the applied methodology.

Some educators incorporated additional activities such as written reflections,^{24,37} oral presentations,²⁴ role-plays,³² or showcase an actual patient consultation recording after screening the fictional audiovisual material.³²

Evaluation and results

Two studies included control groups in their research design.^{33,34} Seven articles mention the use of pre- and post-intervention tests or questionnaires to collect data on acquired knowledge, including questions related to the film and subject matter concepts.^{9,22,26,29,31,32,34} In 6 articles, only post-intervention evaluation was conducted.^{6,27,28,30,32,36} Typically, knowledge assessment was conducted through multiple-choice or open-ended questions.

Based on the results, some authors contend that the incorporation of films and series into medical education enhances student knowledge.^{9,26,31,34} On the other hand, there is a study that suggest that the use of these audiovisual resources alone does not significantly augment students' knowledge and should be complemented with lectures to solidify concepts.³²

Despite disparities in knowledge acquisition outcomes, all studies incorporated student feedback through questionnaires using Likert-type scale questions. Students report that the inclusion of films and series in lessons ignites their interest, enhances motivation, focus, and entertainment value. Furthermore, when compared to traditional seminars based on lecturers' explanations, students perceive that they learn more.²⁷ Students assert that these activities enable them to empathize with patients and see their perspectives.²⁸ Additionally, the use of fictional audiovisual materials cultivates critical and moral thinking, prompting students to ponder issues not typically found in textbooks.⁶

A recurring element across most experiences is the significance of class discussions following the depicted scenes, considered vital for effective learning.^{9,26,34} Only one of the experiences conducted a middle-term evaluation, specifically 15 days after the intervention, and observed positive results in knowledge retention.³³

While the incorporation of films and TV series alongside traditional pedagogical techniques garners favorable reception from students, 2 articles mention that some students believe that interacting with real patients or participating in bedside rounds would be more beneficial for their learning.^{6,36}

It's noteworthy that none of the articles in this review asserted that the use of films and series in classrooms had a negative impact on students' learning, even when certain audiovisual materials portrayed negative attitudes among health professionals, as seen in *House MD*.²⁷ Thus, it underscores the importance of helping students distinguish between fiction and reality, with the lecturer playing a crucial role in this aspect.^{26,27}

Discussion

The landscape of scientific and technological advancements continues to reshape the field of medical education. This transformation underscores the need to promote a more patient-centered, relationship-based, holistic model approach,³⁸ one that facilitates a deeper understanding of patients as individuals.³⁹ Consequently, there is a growing demand for innovative resources capable of fulfilling these evolving needs. This review offer compelling evidence that the integration of films and series into undergraduate medical education represents a highly valuable pedagogical tool for this very purpose.

This review illustrates that while the initial forays into using these audiovisual resources occurred in the USA in 1979,⁵ their integration into classrooms has witnessed remarkable global expansion, encompassing nearly every corner of the world today. Notably, over half of the articles considered in this review were published within the past decade, underscoring the burgeoning awareness and adoption of this innovative pedagogical approach. This review provides the most recent experiences in the literature regarding the use of fictional audiovisual resources in medical education. Its strength lies in its inclusion of both films and series, distinguishing it from the

previous 2018 review,⁴ and its categorization of experiences with medical students.

Our findings indicate that students perceive the use of fictional audiovisual materials as a novel, interactive, and engaging pedagogical approach, which sustains their interest in the subject matter.²⁷ Moreover, while knowledge and skills can be acquired through study and practice, instilling values and attitudes necessitates prior reflection. One of the most effective ways to facilitate this reflection is by presenting scenarios that mimic real-life situations through fictional audiovisual materials. These scenarios stimulate in-depth discussions in which students' critical and moral thinking skills are nurtured.¹³ This explains why the majority of the experiences described to date have focused on this thematic approach, along with a strong emphasis on professionalism and bioethics.^{6,22–25,40} Consequently, this theme has surpassed the traditionally prominent field of psychiatry in terms of attention, as evidenced by previous reviews.^{1,2,4}

Regarding the target audience, it's noteworthy that the experiences predominantly catered to first- and second-year students. This inclination may be attributed to the capacity of fictional audiovisual materials to provide exposure to clinical scenarios without necessitating clinical practice or interactions with real or simulated patients. Consequently, these resources prove highly beneficial for students in the initial years of their academic journey, particularly within pre-clinical phases of medical education. Furthermore, experiences conducted within these early courses tend to demonstrate a more substantial increase in knowledge following the interventions when compared to more advanced courses. As students' progress through their curriculum, they accumulate greater foundational knowledge from previously completed subjects, diminishing the relative impact of the activity on knowledge acquisition.³²

Despite the evolving landscape in film and TV series production and consumption, with the latter gaining significant prominence, this shift has not been fully reflected in university classrooms. Notably, the medical series genre, exemplified by shows like *Grey's Anatomy* or *House MD*, has garnered widespread acclaim, including among health sciences students.^{41–45} These students, especially from medical schools, aside from appreciating the plot, can see their future careers reflected on the screen. However, while classic films continue to be used, the expansive realm of TV series has not been sufficiently integrated into pedagogical experiences with medical students.

Some few studies assert that series offer distinct advantages over traditional cinema. With shorter episode durations and diverse plotlines in each episode, series provide a greater likelihood of discovering material suitable for educational interventions.³⁹ Furthermore, the inclusion of subplots and a fast-paced narrative style effectively engage viewers, which is pivotal for effective learning.²³ It is essential to examine how the depiction of medical doctors has evolved over the years, not only in featured films but also in TV series^{46–49}; instructors should consider that issues related to professionalism and ethics need to take into account these cultural and legislative changes by studying both positive and negative behavioral models.

Regarding to the decision of whether to screen an entire film or selectively utilize specific clips of interest, some authors argue in favor of viewing the complete film, contending that the entire movie contributes to the learning experience,³⁷ while others assert that a few carefully chosen clips are adequate for achieving the intended intervention objectives.^{9,31}

In the examined studies, the post-screening discussion phase, focusing on the content and key themes related to the subject matter, plays a central role in the pedagogical methodology. This is pivotal for generating a substantial portion of the learning process, largely because of active student participation.³⁴

There exists a divergence in opinion regarding the role of the instructor in these discussions. Some contend that the instructor's involvement is fundamental, given that only a minority of doctors who

watch medical series believe they accurately depict everyday hospital life.⁵⁰ It's challenging to find audiovisual materials that faithfully portray real-life scenarios due to the dramatic elements often incorporated⁴; consequently, some authors argue that the teacher plays an essential role in helping students differentiate between reality and fiction.²⁷ However, other authors advocate for a more passive role for the instructor during discussions to maximize the development of students' critical thinking. Furthermore, it is crucial to bear in mind that fictional audiovisual content frequently falls short in accurately portraying medical reality, frequently misrepresenting the roles of healthcare professionals or condensing the timelines of health processes for the sake of narrative efficiency. Literature shows that it is imperative to acknowledge these issues in guided discussions, all the while ensuring that they do not divert students' attention from the teaching objectives (REFERENCE: Cambra Badii I, Baños J.E., The university goes to the movies: our experience using feature films and TV series in teaching health sciences students Kim S., Medical Schools: Past, Present and Future Perspectives Nova Publishers New York 2020 105-148).²⁵

According to the literature, most experiences result in increased knowledge and student satisfaction upon completing the activity. Nevertheless, some authors contend that a traditional lecture before the screening of any audiovisual material is necessary for students to recall theoretical key points or terminology post-experience.³² Striking a balance between traditional pedagogical methods and this new approach may be advisable to ensure effective student learning.

Remarkably, none of the studies pertaining to the use of films and TV series in medical education have addressed the assessment of their impact on the clinical application of knowledge. Additionally, long-term effects on students have not been examined in any of these studies. The methodological challenges that may arise in this type of study (in order to ensure that the gain in knowledge is attributable to the intervention of this methodology and not to other learning that may occur simultaneously in other contexts or subjects) are inevitable but should be addressed promptly.

One of the limitations of this study could be the selection of the study databases, which may exclude some publications in Spanish, such as the *Journal of Medicine and the Movies*, which was a significant source of articles on this topic in a previous review.¹

Future research on these methodologies should incorporate more rigorous designs for their implementation, the selection of audiovisual material, and the measurement of their impact in terms of knowledge, cross-cutting competencies, etc., rather than solely focusing on feasibility and acceptability and on surveys assessing positive student feedback, while we understand that it is a necessary first step in any innovative methodology.

In conclusion, the incorporation of films and TV series into teaching medical students fosters interactive and engaging classroom dynamics while nurturing students' critical thinking abilities. As the educational landscape evolves with advancements in technology, the use of these resources in classrooms is likely to increase. Nonetheless, more research is warranted to comprehensively understand the efficacy of this methodology and its long-term impact, particularly on students' future career as medical doctors.

Declaration of Competing Interest

There's no financial/personal interest or belief that could affect our objectivity.

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