

RESEARCH ARTICLE

Using clips from movies and web series as a pedagogic method for learning pharmacology

Shivani M. Desai ¹, Pradnya V. Kakodkar ²

¹ Department of Pharmacology, Dr. D.Y. Patil Institute of Pharmaceutical Sciences and Research, Pimpri, Pune, India

² Independent Education and Research Consultant, Pune, India

Keywords

Cine-medicine
Education
Feedback
Pharmacology
Student
Teaching

Correspondence

Pradnya Kakodkar
E-202
Mystic
Megapolis
Pune
India
Pradnya.kakodkar@gmail.com

Abstract

Background: Cine-medicine has previously been used in medical teaching. Movies and web series have a great impact on people's lives. The authors were interested to see if it could be used for teaching and engaging pharmacology students. **Objective:** To assess the effectiveness of using clips of movies or web series in Pedagogy for Pharmacology. **Methods:** The study was conducted among 111 Bachelor of Pharmacy, third-year students. An innovative teaching-learning technique was used. Two broad themes were chosen: Pathophysiology of disease and Pharmacology of the drug. Each student had to present one of the themes for seven minutes, the time was divided into three minutes of a clip from a movie or web series they had chosen, and a four minute explanation relating the clip to the theme. After the activity, students' feedback was obtained using a self-designed, pilot tested and validated eight item closed-ended questionnaire with options based on a 5-point Likert scale. **Results:** A total of 97 (87.4%) students completed the pedagogy activity. This teaching method was considered as novel (90.8%), made the class engaging (85.1%), stimulated students' interest (93.1%), potentiated learning (89.6%), helped in knowledge retention (81.6%), made learning fun (88.5%), created more interest and motivation for learning (89.6%) and helped in understanding the concept due to visual imaging (97.7%). **Conclusion:** The use of clips from movies and web series is an effective pedagogic method for learning pharmacology.

Introduction

Innovation in education continues to improve the learning methods available for students. Although lecture-based teaching continues to be a primary method of education, a diversity of audio-visual media are also familiarised in the classroom setting (Law *et al.*, 2015). Evidence suggests that in the 1890s, physicians used to record the patients and use the footage as a teaching aid (Essex-Lopresti, 1997).

Cinemas have always shown an incredible aptitude for engaging people around the globe. Some popular medical-based films can benefit teachers by introducing medical

scenarios and pharmacological applications of certain drugs to the students, which traditional educational methods may not be able to explain with ease (Banos & Bosch, 2015).

Emotions play an explicit role in learning, audio-visual media can augment emotions thereby making learning more pleasurable and memorable (Blasco *et al.*, 2006; Taylor, 2010). The usage of cinema in education can teach a variety of subjects and skills to students, such as: good communication skills, demonstrating a protective doctor-centric approach to medicine, and cultivating an ethical

conversation about palliative care and dying (Darbyshire & Baker, 2010). The use of video clips in the classroom has various learning values. These include: grabbing students' attention, improving the students' concentration, generating interest in class, creating a sense of anticipation, energising the students for learning activities, enhancing students' imagination, enhancing content and learning attitudes, building student-teacher connection, increasing memory, increasing understanding, fostering creativity and deep learning, stimulating the flow of ideas, providing freedom of expression, inspiring and motivating students, making learning fun, setting an appropriate mood for learning, decreasing tension and anxiety on scary and challenging topics and creating memorable visual images (Berk, 2009).

Cinema has a promising role in education concerning nurturing compassionate orientations. Evidence has shown that students benefit greatly and find this type of teaching engaging (Law *et al.*, 2015). A study was conducted to evaluate the application of 'cine medicine' as a technique in teaching medical students about the psychosocial aspects of medicine at Tehran University of Medical Sciences; the results demonstrated that cinema is highly effective for this (Kadivar *et al.*, 2018). Another study investigated the impact of pharmacology-related short movies during lectures and their effect on stimulating learning among undergraduate students. Here, one-to two-minute movie clips which contained an orientation of the subject taught were fused into the presentations and shown at different times during the lectures. With the help of the students' survey, it was concluded that the short movie references were an innovative teaching technique that motivated the students to maintain their interest throughout the lectures (Ventura & Onsman, 2009). Literature is replete with reports on using movies for effective classroom teaching (Essex-Lopresti, 1997; Blasco *et al.*, 2006; Berk, 2009; Ventura & Onsman, 2009; Banos & Bosch, 2015; Kadivar *et al.*, 2018).

Pharmacology is a branch of pharmaceutical sciences that is related to the study of drugs for a particular disease/disorder in a living organism. It has two main branches: pharmacokinetics and pharmacodynamics. As per the National Board of Accreditation (2013), for undergraduate pharmacy education, the student should be trained in constructive skills like pharmacology knowledge, planning abilities, problem analysis, modern tool usage, leadership skills, professional identity, pharmaceutical ethics, communication and life-long learning. Building and fortifying these aptitudes among students is challenging. Owing to the literature support that cine medicine is an effective teaching technique, the authors felt that the pharma-

cology students could be trained using this technique (including clips from movies and web series in the pedagogy). This study aimed to assess the effectiveness of using clips of movies or web series in Pedagogy by the students for learning Pharmacology

Materials and methods

The study was conducted among third-year students enrolled in the Bachelor of Pharmacy at Dr. D.Y. Patil Institute of Pharmaceutical Sciences and Research, Pimpri, Maharashtra, India. The class constituted of 111 students. In the first three months of the term, pharmacology and all the curricular topics were taught as per the syllabus. For training in constructive skills, it was decided that the innovative teaching-learning technique would be used. Two broad topics were chosen: Pathophysiology of disease and Pharmacology of the drug. The students were divided into groups and each student group had to present a pedagogy on any one of these themes. The pedagogy presentation was seven minutes long, which was divided into three minutes from a clip from a film or web series and a four minute explanation about their chosen topic. The pedagogy notes had to be written down in 200 words with scientific justification. This was a well-planned activity, with presentation slots and time schedules prepared in advance and informed to the groups.

The student groups selected the movie or web series based upon the chosen theme, which was then approved by the coordinator. They were given ten days for preparation. Three days (90 minutes per day) were allotted for the presentation. Each group delivered their presentation, followed by a question and answer session from the audience, which consisted of colleagues and faculty members.

After the activity, students' feedback was obtained using a eight item closed-ended questionnaire. Each question had five choices (strongly agree, agree, neutral, disagree, or strongly disagree). Feedback data was collected from the google form, which was emailed to all the student participants. The participation for the questionnaire was voluntary, and the responses were collected anonymously. The eight-item feedback form was self designed, pilot tested and checked for face validity, content validity, and reliability.

Results

Out of the 111 students, only 97 (87.4%) students completed the pedagogy activity. There were 48 males and 49 females, with ages between 20 to 22 years old. 24 students (six groups) made presentations on the pathophysiology of a disease like hypertension, digitalis toxicity, and heart attack; 16 students (four groups) made presentations on drug abuse, and 57 (14 groups) made presentations on the pharmacology of a drug like ephedrine, diazepam, nitrates, and opioids. Out of the 97 students, only 85 (87.6%) answered the feedback questionnaire.

Table I depicts the feedback responses from the students. The majority of the students opted for strongly agree or agree options for all eight questions, with a response range from 26.4% to 57.5%. The students who opted for neutral responses ranged from 2.3% to 14.9%. There was minimum disagreement in the range of 1.2% to 3.5 % for Questions 2, 5, 6, and 7.

Table I: Student feedback responses

Questions	Responses (%)				
	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Using film clips is a novel way of teaching and learning in the classroom.	41.4	49.4	9.2	-	-
Using film clips makes the class engaging.	36.8	48.3	12.6	2.3	-
Using movie clips while teaching stimulate students' interest	49.4	43.7	6.9	-	-
Using Movie clips helps me in learning	33.3	56.3	10.3	-	-
Using movie clips helps me in knowledge retention.	26.4	55.2	14.9	3.5	-
Using movie clips during teaching is like making learning fun	50.6	37.9	10.3	1.2	-
Using movie clips during teaching is like creating more interest and motivation for learning	40.2	49.4	9.2	1.2	-
Using movie clips during teaching creates memorable visual images	40.2	57.5	2.3	-	-

Table II describes some of the clips from web series and films used for the pedagogy.

Table II: An example of clips from web series and films used in the pedagogue to explain Ephedrine, drug and alcohol addictions, heart attacks and CPR

Movie/Web series clip	Learning outcomes	Conclusion
<p>A clip from 'Hostages' - a web series on Disney Hotstar.</p> <p>Dr. Meera Anand's family are kidnapped and the kidnaper wants her to kill the Chief minister (CM) while operating on him. Dr. Anand does not want to kill the CM, hence she gives the CM ephedrine alongside his other medicines. The plan is to delay the operation and to rescue her family members. Ephedrine is given as it increases blood pressure without any major side effects, and the operation is delayed.</p>	To illustrate the use of Ephedrine, its properties and effect.	Ephedrine is sympathomimetic amine which acts on the somatic nervous system. When given to healthy person, it increases their blood pressure due to direct stimulation of the adrenergic receptor. It is used to treat hypotension. Here, the students explained the properties and mechanism of ephedrine and explained how it was used for a good cause.
<p>A clip from 'Kabir Singh' - a movie.</p> <p>Here, Kabir Singh falls in love with a woman who cannot be with him due to family pressure. Kabir Singh is a renowned and successful surgeon. Due to personal difficulties, he is a drug and alcohol addict. One day, while he is performing surgery, he collapses and his blood investigation shows traces of cocaine and alcohol.</p>	To illustrate the effects of cocaine and alcohol.	To combat emotional distress the character uses cocaine and alcohol. The effects of cocaine use include feeling: joy from a boost in dopamine levels in the brain, more energetic, more talkative and mentally alert. Alcohol was used to curb the withdrawal and anxiety when the effects from the cocaine started to wear off. The student explained drug abuse and emotional distress.
<p>A clip from 'Nikki and Neeraj' - movie on Youtube.</p> <p>An elderly male character, Tatya, is sitting on the sofa and is shown to have chest pain. The house servant calls the family members and the doctor. The doctor checks Tatya's heart rate and the family member gives chest compressions as CPR to Tatya, who is in a sitting position, still breathing and conscious. Tatya is taken rapidly to the hospital, where the doctor injects medicines through IV routes. Tatya is shown to feel better.</p>	To illustrate the use of Beta-blockers and the incorrect application of CPR.	CPR should be done on a person who has become unconscious, is not breathing and has no pulse. Here, the character was conscious, breathing and had a pulse. Yet, CPR was performed in a sitting position. This clip helps to show when and how not to perform CPR. Secondly, the injection given is probably Beta-blockers which are shown to have a vasodilating effect. They interfere with the binding of epinephrine to its receptor, causing the heart rate and blood pressure to lower. Beta-blockers are used for the treatment of hypertension, arrhythmia and prevention of myocardial infarction.

Discussion

Historically, traditional teaching methods have included lectures, tutorials, and practical's, which are mostly directed toward information dissemination rather than active learning by the students (Jalgaonkar *et al.*, 2019). Majagi, Torgal & Hiremath (2012), have enlisted novel teaching methods in pharmacology, which include the use of audiotapes, virtual access to teachers through computers, mobile interactions with teachers, web-based teaching/assignments, mobile tips/ short message systems, problem-based learning and use of animals in practicals.

For 21st-century students (Generation Z or the socially digital kids), however, digital technology has led to new ways of teaching and learning (Mynbayeva, Sadvakassova, & Akshalova, 2017). During the COVID19 pandemic, digitally assisted teaching and learning in the synchronous or asynchronous form significantly benefitted the global learner community. In the past, feature films have proved to be a powerful teaching tool (Banos & Bosch, 2013). The use of film clips in teaching is an effective, valuable, innovative, relatively simple strategy, enjoyable for the learner, and adds a human element to the content (Herrman, 2006). The students have easy access to digital platforms and the availability of abundant information through movies and web series makes it simple for them to use it to aid their learning of pharmacology.

The present study's results concur with the study by Levy (2015), who reported on the teachers use of film clips for classroom teaching for an undergraduate Business Law course. Levy (2015) recorded that 96.0% strongly agreed that using film clips makes the class more engaging, 73.9% said it helped them learn, and only 1.4% disagreed. Overall, students have shown high acceptability for the use of online videos as a supplementary teaching tool (Jalgaonkar *et al.*, 2019). Lim and colleagues (2006) evaluated students' feedback on the video included in a PowerPoint presentation and concluded that it helped them to sustain interest in the lecture; 97.7% agreed that the videos helped them to better visualise concepts, 81.0% felt that videos would help them better remember facts and 97.2% believed that the videos helped in their understanding of the lecture.

Innovations are needed in teaching-learning techniques to retain students' interest in subjects. This movie/web-series inclusion pedagogy activity helped students in constructive skill development like planning abilities, problem analysis, modern tool usage, leadership skills, professional identity, pharmaceutical ethics, communication, and life-

long learning. The students designed the whole activity by collecting all the clips and arranging the presentation schedule, seminar hall, and other requirements. This gave them a flavour of planning the whole activity by themselves, solving the hurdles in such activities, and teaching leadership skills. The students were exposed to all the modern tools during this activity, such as video-making apps, advanced projectors, and multimedia devices. They understood the application of pharmacological knowledge in real-time scenarios and understood their professional identity and importance. They also could comprehend the ethical rules and the value of life-long learning. Presenting their views in front of the audience enhanced communication skills and self-confidence.

The usage of cine medicine has been practiced for a long time, and it has helped teachers to better explain real-time scenarios (Banos & Bosch, 2015). All of the studies reported in the literature (Essex-Lopresti, 1997; Blasco *et al.*, 2006; Lim *et al.*, 2006; Berk, 2009; Ventura & Onsmann, 2009; Banos & Bosch, 2015; Levy, 2015; Kadivar *et al.*, 2018) concentrate on the the teachers reported use of cinema clips for their teaching. However, this study is the first of its kind where students have used movie and web series clips for their pedagogy.

Since it was an experiment conducted for the first time, the study has some limitations. Not all students participated in this activity; the authors could not group the presentations according to the diseases and drugs; and some student groups did not strictly follow the themes. The study results presented here are obtained from an experimental trial in only a single term. Within the study's limits, it is recommended that this innovative method is effective for learning. In the future, the authors plan to make a databank of the clips of movies and web series used and make it available to all so that it can be used for training students worldwide.

Conclusion

Including clips from movies/ web series in pedagogy for student learning is effective. It makes the class engaging, stimulates students' interest, potentiates learning, helps in knowledge retention, makes learning fun, creates more interest and motivation for learning, and helps understand the concept due to visual imaging. This pedagogy method is a fun-based activity that can enhance the understanding of the subject. Thus, it would be advantageous to include this practice as an innovative teaching technique.

Acknowledgements

The authors are thankful to the principal, Dr. Sohan S. Chitlange, and the management of Dr. D.Y. Patil Institute of Pharmaceutical Sciences and Research, Pune. The authors are also thankful to the student participants who enthusiastically and willingly participated in this experiment.

Conflict of Interest

The authors declare no conflict of interest.

References

- Baños, J.-E., & Bosch, F. (2015). Using feature films as a teaching tool in medical schools. *Education Medica*, *16*(4), 206-11. <https://doi.org/10.1016/j.edumed.2015.09.001>
- Berk, R.A. (2009) Multimedia teaching with video clips: TV, movies, YouTube, and mtvU in the college classroom. *International Journal of Technology in Teaching and Learning*, *5*, 1-21
- Blasco, P.G., Moreto, G., Roncoletta, A.F., Levites, M.R., & Janaudis, M.A. (2006). Using movie clips to foster learners' reflection: improving education in the affective domain. *Family Medicine*, *38*, 94-96
- Darbyshire, D., & Baker, P. (2012). A systematic review and thematic analysis of cinema in medical education. *Medical Humanities*, *38*, 28-33. <https://doi.org/10.1136/medhum-2011-010026>
- Essex-Lopresti, M. (1997). Centenary of the medical film. *The Lancet*, *349*(9055), 819-820. [https://doi.org/10.1016/S0140-6736\(05\)61747-3](https://doi.org/10.1016/S0140-6736(05)61747-3)
- Herrman, J.W. (2006). Using film clips to enhance nursing education. *Nurse Educator*, *31*, 264-269. <https://doi.org/10.1097/00006223-200611000-00010>
- Jalgaonkar, S.V., Tripathi, R.K., Sarkate, P.V., Salagre, S.B., Itollikar, S.M., & Rege, N.N.(2019) Online videos as a supplement tool to train II MBBS students in drug administration skills. *Journal of Pharmacology and Pharmacotherapy*, *10*, 111-117
- Kadivar, M., Mafinejad, M.K., Bazzaz, J.T., Mirzazadeh, A., & Jannat, Z. (2018). Cinemedicine: Using movies to improve students' understanding of psychosocial aspects of medicine. *Annals of Medicine and Surgery*, *28*, 23-27
- Law, M., Kwong, W., Friesen, F., Veinot, P., & Ng, S.L. (2015). The current landscape of television and movies in medical education. *Perspectives on Medical Education*, *4*(5), 218-224. <https://doi.org/10.1007/s40037-015-0205-9>
- Levy, B.R. (2015) Using Film Clips in the Classroom: Something Old, Something New? *Journal of Teaching and Learning with Technology*, *4*, 41-50
- Lim, E.C., Ong, B.K., Wilder-Smith, E.P., & Seet, R.C. (2006). Sustaining interest during lectures with the use of multimedia. *Medical Education Online*. Available from: https://www.academia.edu/44319866/Sustaining_Interest_During_Lectures_with_the_use_of_Multi-media
- Majagi, S.I., Torgal, S.S., & Hiremath, S.V. (2012). Students attitude towards different teaching methods in pharmacology. *Asian Journal of Pharmaceutical and Health Sciences*, *2*, 504- 512
- Mynbayeva, A., Sadvakassova, Z., & Akshalova, B. (2017). Pedagogy of the twenty-First century: Innovative Teaching methods. (pp. 1). Available from: <https://www.intechopen.com/books/new-pedagogical-challenges-in-the-21st-century-contributions-of-research-in-education/pedagogy-of-the-twenty-first-century-innovative-teaching-methods>
- National Board of Accreditation (2013). Accreditation Manual for Pharmacy UG Programmes (Tier-I). (pp. 22). New Delhi
- Taylor, J.S. (2010). Learning with emotion: a powerful and effective pedagogical technique. *Academic Medicine : Journal of the Association of American Medical Colleges*, *85*, 1110. <https://doi.org/10.1097/ACM.0b013e3181e202d3>
- Ventura, S., & Onsmann, A. (2009). The use of popular movies during lectures to aid the teaching and learning of undergraduate pharmacology. *Medical Teacher*, *31*, 662-664. <https://doi.org/10.1080/01421590802641489>