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Cinemeducation: An auxiliary tool to traditional teaching learning methods for teaching Forensic Medicine to undergraduates

Background: Feature films can be powerful teaching tools and are increasingly used in teaching health sciences. Their power is irresistible as many films consider medical issues. However, there are only few studies which have quantified the effectiveness of using feature films as a method of teaching. Adequate assessment is critical to establish the legitimacy of using the film as a teaching activity.

Method: A Quasi-experimental Study was initiated after Ethics Committee approval at Karuna Medical College, Palakkad, Kerala. Informed consent was taken. 90 students were divided into two groups using lottery system. Six movie clips corresponding to the topic were chosen. For one group the topic was delivered through a traditional method and for another group video of the same topic was also shown. Posttest was collected in form of Multiple Choice Questions (MCQ) and crossing over was done. Six sessions were conducted. Fifteen-day memory retention test was conducted for both groups to assess if movies clips helped in student learning and long-term memory retention.

Results: A total of 90 students participated. Assessment scores were significantly higher for the groups which were taught using movies along with traditional teaching for 5 out of 6 sessions. It was found that movie clips enhanced learning and long-term memory retention as P value was statistically significant. Most of the participants agreed that movie clips along with the traditional teaching has made their understanding better

Conclusion: Cinemeducation is an effective auxiliary tool to traditional teaching learning methods for teaching Forensic Medicine to undergraduates.

Keywords: Medical Education, Training, Forensic Medicine, Cinemeducation

آموزش سینمایی (آموزش در قالب فیلم): ابزاری کمکی برای روش‌های یادگیری سنتی آموزش جهت پزشکی قانونی به دانشجویان کارشناسی

زمینه و هدف: فیلم‌های بلند ابزار آموزشی قدرتمندی هستند که به طور فزاینده‌ای در آموزش علوم پزشکی مورد استفاده قرار می‌گیرند. فیلم‌ها در زمینه آموزش بسیار قوی هستند با این وجود، مطالعات کمی وجود دارد که اثربخشی استفاده از فیلم‌های داستانی را به عنوان روشی برای آموزش تعیین کرده باشد. تشخیص و ارزیابی کافی برای اثبات مشروعیت استفاده از فیلم به عنوان یک فعالیت آموزشی بسیار مهم است.

روش: یک مطالعه نیمه آزمایشی پس از تأیید کمیته اخلاق در کالج پزشکی کارونا، پالاکاد، کرالا اجرا شد. ابتدا رضایت آگاهانه گرفته شد. ۹۰ دانشجویان با قرعه‌کشی به دو گروه تقسیم شدند. شش کلیپ متناسب با موضوع انتخاب شد. برای یک گروه موضوع به روش سنتی ارائه شد و برای گروه دیگر نیز ویدیوی همان موضوع نمایش داده شد. سپس آزمون به صورت سوالات چند گزینه‌ای انجام شد. شش جلسه برگزار گردید. به منظور ارزیابی نقش کلیپ‌های فیلم در یادگیری دانشجویان و کمک به حفظ حافظه بلند مدت آنها آزمون حفظ حافظه در طی پانزده روزه برای هر دو گروه انجام شد.

یافته‌ها: نمرات ارزشیابی برای گروه‌هایی که در پنج جلسه از شش جلسه با استفاده از فیلم همراه با آموزش سنتی آموزش داده شدند، به طور معنی‌داری بالاتر بود. کلیپ‌های فیلم، یادگیری و حافظه بلندمدت را ارتقا داد و مقدار P از نظر آماری معنی‌دار بود. اکثر شرکت‌کنندگان موافق بودند که کلیپ‌های فیلم همراه با آموزش سنتی باعث درک بهتر آنها شده است.

نتیجه‌گیری: آموزش سینمایی ابزار کمکی مؤثری برای روش‌های سنتی آموزش جهت آموزش پزشکی قانونی به دانشجویان کارشناسی است.

واژه‌های کلیدی: آموزش پزشکی، آموزش، پزشکی قانونی، آموزش سینمایی

التعليم السينمائي: أداة مساعدة لطرق التعلم التقليدية لتدريس الطب الشرعي للطلاب الجامعيين

الخلفية: يمكن أن تكون الأفلام الطويلة أدوات تعليمية قوية وتستخدم بشكل متزايد في تدريس العلوم الصحية. قوتهم لا تقاوم حيث أن العديد من الأفلام تنظر في القضايا الطبية. ومع ذلك، لا يوجد سوى عدد قليل من الدراسات التي حددت فعالية استخدام الأفلام الطويلة كوسيلة للتدريس. التقييم المناسب أمر بالغ الأهمية لإثبات شرعية استخدام الفيلم كنشاط تعليمي.

الطريقة: بدأت دراسة شبه تجريبية بعد موافقة لجنة الأخلاقيات في كلية الطب كارونا، بالاكاد، كيرالا. تم أخذ الموافقة المسبقة. تم تقسيم 90 طالباً إلى مجموعتين باستخدام نظام اليانصيب. تم اختيار ستة مقاطع فيلم مطابقة للموضوع. بالنسبة لمجموعة واحدة، تم تسليم الموضوع بطريقة تقليدية، كما تم عرض فيديو جماعي آخر لنفس الموضوع. تم جمع الاختبار اللاحق في شكل أسئلة الاختيار من متعدد (MCQ) وتم إجراء العجور. تم إجراء ست جلسات. تم إجراء اختبار الاحتفاظ بالذاكرة لمدة خمسة عشر يوماً لكلا المجموعتين لتقييم ما إذا كانت مقاطع الأفلام تساعد في تعلم الطلاب والاحتفاظ بالذاكرة على المدى الطويل.

النتائج: شارك ما مجموعه 90 طالباً. كانت درجات التقييم أعلى بشكل ملحوظ للمجموعات التي تم تدريسها باستخدام الأفلام جنباً إلى جنب مع التدريس التقليدي لـ 5 من أصل 6 جلسات. وجد أن مقاطع الفيلم عززت التعلم والاحتفاظ بالذاكرة على المدى الطويل حيث كانت قيمة P ذات دلالة إحصائية. اتفق معظم المشاركين على أن مقاطع الأفلام جنباً إلى جنب مع التدريس التقليدي جعلت فهمهم أفضل

الخلاصة: التعليم السينمائي هو أداة مساعدة فعالة لطرق التعلم التقليدية لتدريس الطب الشرعي للطلاب الجامعيين.

الكلمات المفتاحية: التعليم الطبي، التدريب، الطب الشرعي، التعليم السينمائي

سينیٹوکیویشن: انڈرگریجویٹس کو فرانزک میڈیسن سکھانے کے لیے روایتی تدریسی سیکھنے کے طریقوں کا ایک معاون ٹول

پس منظر: فیچر فلمیں طاقتور تدریسی ٹول ہو سکتی ہیں اور صحت کے علوم کی تعلیم میں تیزی سے استعمال ہوتی ہیں۔ ان کی طاقت ناقابل تلافی ہے کیونکہ بہت سی فلمیں طبی مسائل پر غور کرتی ہیں۔ تاہم، صرف چند ایسے مطالعات ہیں جنہوں نے فیچر فلموں کو تدریس کے طریقہ کار کے طور پر استعمال کرنے کی تاثیر کا اندازہ لگایا ہے۔ فلم کو تدریسی سرگرمی کے طور پر استعمال کرنے کی قانونی حیثیت کو قائم کرنے کے لیے مناسب تشخیص ضروری ہے۔

طریقہ: کرونا میڈیکل کالج، پالاکاڈ، کیرالہ میں اخلاقیات کمیٹی کی منظوری کے بعد ایک نچر تجرباتی مطالعہ شروع کیا گیا۔ باخبر رضامندی لی گئی۔ لائری سسٹم کا استعمال کرتے ہوئے 90 طلباء کو دو گروہوں میں تقسیم کیا گیا۔ موضوع کے مطابق چھ فلمی کلیپس کا انتخاب کیا گیا۔ ایک گروپ کے لیے موضوع روایتی طریقے سے پہنچایا گیا اور دوسرے گروپ کے لیے اسی موضوع کی ویڈیو بھی دکھائی گئی۔ پوسٹ ٹیسٹ ایک سے زیادہ انتخابی سوالات کی شکل میں جمع کیا گیا تھا اور کراسنگ اور کیا گیا تھا۔ چھ سیشن ہوئے۔ دونوں گروہوں کے لیے پندرہ روزہ میموری برقرار رکھنے کا ٹیسٹ منعقد کیا گیا تاکہ اس بات کا اندازہ لگایا جا سکے کہ آیا فلموں کے کلیپس نے طلبہ کے سیکھنے اور طویل مدتی یادداشت برقرار رکھنے میں مدد کی ہے۔

نتائج: کل 90 طلباء نے حصہ لیا۔ 6 میں سے 5 سیشنز کے لیے روایتی تدریس کے ساتھ ساتھ فلموں کا استعمال کرتے ہوئے سکھانے جانے والے گروہوں کے لیے تشخیص کے اسکور نمایاں طور پر زیادہ تھے۔ یہ پایا گیا کہ موری کلیپس نے سیکھنے اور طویل مدتی میموری کو برقرار رکھنے میں اضافہ کیا کیونکہ P قدر اعدادوشمار کے لحاظ سے اہم تھی۔ زیادہ تر شرکاء نے اس بات پر اتفاق کیا کہ روایتی تعلیم کے ساتھ ساتھ فلمی کلیپس نے ان کی سمجھ کو بہتر بنایا ہے۔

نتیجہ: انڈرگریجویٹس کو فرانزک میڈیسن سکھانے کے لیے سینی میڈیکیشن روایتی تدریسی سیکھنے کے طریقوں کا ایک مؤثر معاون ٹول ہے۔

مطلوبہ الفاظ: طبی تعلیم، تربیت، فرانزک میڈیسن، سینی میڈیسن

INTRODUCTION

Interactive teaching methods as a teaching tool are very effective. Boon (1) summarized it as follows: "Medicine provides a fertile territory for studying relationships between lay publics and elite discourses in science and technology more broadly, in which all media of communication have had a role as the 'vehicles of communication' between science and the public." Cinema is the audio-visual version of storytelling. Life stories and narratives enhance emotions and therefore set up the foundation for conveying concepts. We know that in the clinical setting, the life histories of patients are a powerful resource in teaching. Similarly, when the goal is promoting reflection that includes both cognitive and emotional components, life histories derived from the movies are well matched with the students' desires and expectations (2). Cinemeducation refers to the use of movies on video, particularly clips from such videos, for educating medical students in the psychosocial aspects of medicine. Recent articles in the medical literature have provided support for the idea that the use of such videos provides innovative and effective ways of teaching (3-5).

Many times, while watching movies the author could relate to certain aspects of teachings and that has helped him to understand the topic in a better manner. The author was using movie clips during lectures with an opinion that it will help the students also understand concepts in Forensic Medicine. The term was introduced to the author during Medical Council of India (MCI) Revised Basic Course Workshop and was interested to know if showing the movies was helping students to learn. There are very few studies related to this study where quantitative analysis of marks obtained is done, when movie clips are used. So, the present study was undertaken with an objective to study the Effectiveness of movie clipping along with traditional teaching learning methods in teaching Forensic Medicine to 2nd MBBS (Bachelor of Medicine and Bachelor of Surgery) undergraduate students.

METHODS

This was a Quasi - Experimental study conducted in the Department of Forensic Medicine at Karuna Medical College, Palakkad, Kerala with an objective of understanding the effectiveness of using movie clips for teaching Forensic Medicine to undergraduate students and to assess the perception of students to the new teaching learning methods. The study was started with a hypothesis that "Cinemeducation is an effective auxiliary tool to traditional teaching learning methods for teaching Forensic Medicine to undergraduates." The study was conducted for a period of three months from June 2019 to August 2019 after obtaining approval from the Institutional Human Ethical Committee. All the Undergraduate Medical Students who were in the second year of their course and consented for the study were included in the study. Any student who did not consent for the study or was absent when the lectures were delivered were excluded from the study.

Following topics were selected for the study where corresponding movie clips/ videos pertaining to the same

were available.

- 1) Crime scene investigation and concept of Corpus Delecti
- 2) Recording of evidence in court (court procedure)
- 3) Medico legal autopsy
- 4) Medical professionalism and doctor patient relationships
- 5) Therapeutic treatment and therapeutic research Clinical trials: laws and standard. Informed consent & Ethics Committee
- 6) Pedestrian injuries in Road traffic accidents & whiplash injury of neck

The movies/videos which were selected for above topics are

- 1) Clips from movie Agent Sai Srinivasa Atherya and Drishyam.
- 2) Courtroom scene from the movie Pink, recording of a moot court conducted in Medical College.
- 3) Recording of a complete autopsy, scene from movie Autopsy of Jane doe.
- 4) Clips from movie Patch Adams.
- 5) Clips from movie Awakenings.
- 6) Movie Raja Rani accident scene for pedestrian injuries in road traffic accidents and video from you tube.

The criteria used for selecting the video were that the video should pertain to medical knowledge in accordance with the course being taken at that time, and for the topic medical professionalism, the selected movie had to involve doctors as main characters.

Once the topics were finalized, the informed consent was obtained from the participants. They were informed of the study design, objectives and method of recording the data. Total of 90 participants were part of the study. The participants were divided into two groups of 45 each by lottery system. A total of six sessions were conducted during the study period in which one group was taught the topic with traditional teaching learning method and the other group was taught with traditional teaching learning method along with that related video in accordance with the course was shown to them. After the session a post test was conducted for both groups consisting of multiple-choice questions from the topic of discussion. For the second session there was crossing over of groups and the method of teaching for the first group was traditional teaching learning method along with video and the second group was taught with only traditional teaching method.

Crossing over was done again for the rest of the four sessions and the content was delivered in the decided format. After each session a post test was conducted in the form of multiple-choice questions of the concerned topic. Once all the sessions were completed both groups were shown the videos which were not shown to them during the study.

The participants were divided into 2 groups for each session. For first session they were marked as A1 & A2 similarly for subsequent sessions they were marked as B1 & B2 C1 & C2, D1 & D2, E1 & E2 and F1 & F2, all the groups which were marked as "1" lecture was delivered for them and all the groups marked as "2" lecture along with a movie/video clip were shown.

A test for long term memory retention was also conducted after 15 days on the topics dealt in the form of multiple-

choice questions and responses were recorded and labelled as A3 & A4, B3 & B4, C3 & C4, D3 & D4, E3 & E4 and F3 and F4. The groups marked “3” memory retention test was done for traditional teaching method and all the groups marked “4” memory retention test was done for traditional teaching method along with video. P values were calculated for each session and also P values were calculated for memory retention for each session.

A response was collected from the students regarding their perceptions about use of movie clips and videos for teaching Forensic Medicine in a predesigned validated Likert scale questionnaire, at the end of study.

All data was collected after every session in the form of posttest which comprised of multiple-choice questions and perception was collected in the end with help of a feedback form. All the data was entered in Microsoft excel sheet.

Mean Average of all scores were calculated for each topic where only traditional teaching learning method was used and where movie/video clip were shown along with traditional teaching learning method and 15-day memory retention test scores were also tabulated for all six sessions and averages of the same were taken.

The data for each session was compared using unpaired t test and p values were calculated using online unpaired t test and p values calculator from the website <https://www.socscistatistics.com/>

P values for individual sessions were calculated for both groups and similarly calculated for an individual session for both groups for 15-day memory test. Perceptions were recorded in a predesigned prevalidated 5-point Likert scale and frequency distribution and percentages were calculated using Microsoft Excel.

RESULTS

The study was conducted in six sessions with a total of 90 student participants. For each session the average scores of the students was tabulated and P-value was calculated.

For the first session the average score for group A1 was 7.47 and the average score for group A2 was 7.73. The t-value is -1.38. The p-value is .0856 at significance level of 0.05. The

result is not significant at $P < 0.05$. For the same group marked as A3 & A4 for memory retention test the average score for the two groups were 6.38 and 6.76. The t-value is -1.97. The p-value is 0.026 at significance level of 0.05. The result is significant at $P < 0.05$. The average fall in score with the two methods was 1.09 and 0.97. It was observed that the fall in score was higher when only traditional teaching learning method is used.

For the second session the average score for group B1 was 7.96 and the average score or group B2 was 8.38. The t-value is -2.15. The P-value is .017 at significance level of 0.05. The result is significant at $P < 0.05$. For the same group marked as B3 & B4 for memory retention test the average score for the two groups were 6.73 and 7.11. The t-value is -2.05. The p-value is 0.022 at significance level of 0.05. The result is significant at $P < 0.05$. The average fall in score with the two methods was 1.23 and 1.27. It was observed that the fall in score was higher for traditional teaching learning method along with videos.

For the third session the average scores for the two groups C1 & C2 were 7.58 and 7.96. the t-value is -2.77 the P value for the scores was 0.003 at significance level of 0.05. The result is significant at $P < 0.05$. For the same group marked as C3 & C4 for memory retention test the average score for the two groups were 6.58 and 7.00. The T value is -2.87 and the P value for the score was 0.003 at significance level of 0.05. The result is significant at $P < 0.05$. The average falls in score with the two methods were 1.00 and 0.96. It was observed that the fall in score was higher when only traditional teaching learning method is used.

For the fourth session the average scores for the two groups D1 & D2 were 7.93 and 8.22. the t-value is -1.93 and the p value for the scores was 0.029 at significance level of 0.05. The result is significant at $P < 0.05$. For the same group marked as D3 & D4 for memory retention test the average score for the two groups were 6.56 and 6.82. the t-value is -1.76 and the P value for the score was 0.041 at significance level of 0.05. The result is significant at $P < 0.05$. The average falls in score with the two methods were 1.37 and 1.40 it is observed that the average fall in score was higher for traditional teaching learning method along with videos.

Table 1. Average Mean Scores for each intervention (Post Test)

Sl. No	Groups	Average marks		Difference	P value**	t value
		TTLM(SD)	TTLM with Video (SD)			
1	A1 Vs A2	7.47(1.01)	7.73(0.809)	0.26	0.856*	-1.38
2	B1 Vs B2	7.96(0.975)	8.38(0.886)	0.42	0.017	-2.15
3	C1 Vs C2	7.58(0.621)	7.96(0.672)	0.38	0.003	-2.77
4	D1 Vs D2	7.93(0.687)	8.22(0.735)	0.29	0.029	-1.93
5	E1 Vs E2	7.29(0.757)	7.73(0.653)	0.44	0.0002	-2.98
6	F1 Vs F2	7.47(0.547)	7.76(0.743)	0.29	0.019	-2.1

*P value was not significant
 ** P value is obtained by T-Test Calculator for 2 Independent Means
 TTLM: Traditional Teaching Learning Method
 SD: Standard Deviation

For the fifth session the average scores for the two groups E1 & E2 were 7.29 and 7.73. The t-value is -2.98 and the P value for the scores was 0.0002 at significance level of 0.05. The result is significant at $P < 0.05$. For the same group marked as E3 & E4 for memory retention test the average score for the two groups were 6.42 and 6.76. the t-value is -2.43 and the P value for the score was 0.009 at significance level of 0.05. The result is significant at $P < 0.05$. The average fall in score with the two methods were 0.87 and 0.97 it is observed that the fall in score was higher for traditional teaching learning method along with videos.

For the sixth session the average scores for the two groups F1 & F2 were 7.47 and 7.76. the t-value is -2.1 and the P value for the scores was 0.019 at significance level of 0.05. The result is significant at $P < 0.05$. For the same group marked as F3 & F4 for memory retention test the average score for the two groups were 5.96 and 6.24. the t-value is -2.26 and the P value for the score was 0.013 at significance level of 0.05. The result is significant at $P < 0.05$. The average fall in score with the two methods were 1.51 and 1.52 it is observed that the fall in score was almost equal for both methods.

Statistically significant P values were observed in 5 out of 6 sessions except for A1VsA2 for the post test conducted after the lecture was delivered as described in the methodology. P value was statistically significant in all the sessions for 15-day memory retention test.

Perceptions of the students were recorded on a pre-designed pre-validated 5-point Likert scale consisting of ten questions. After all the six sessions and long-term memory testing data was collected, all the participants were given printed feedback forms with explanation as to how to fill in their responses. They were also asked to record their responses against each question anonymously. All the responses were tabulated and a frequency table was prepared (Table 3). From the frequency table percentages of responses were calculated. It was observed that the movie/video clips were well accepted and appreciated by the participants as all the participants agreed that this method has improved their learning and it was helpful for them to understand the topic. 15.6% of the participants gave a neutral response to whether the new method has motivated them to learn and 1.1 % of the participants disagreed for the same while the rest of the participants agreed.

Table 2. Average Mean Scores for Memory Retention

Sl. No	Groups	Average marks		Difference	P value**	t value
		TTLM(SD)	TTLM with Video (SD)			
1	A3 Vs A4	6.38(1)	6.76(0.802)	0.38	0.026	-1.97
2	B3 Vs B4	6.73(1.05)	7.11(0.647)	0.38	0.022	-2.05
3	C3 Vs C4	6.58(0.690)	7(0.707)	0.42	0.003	-2.87
4	D3 Vs D4	6.56(0.784)	6.82(0.649)	0.26	0.041	-1.76
5	E3 Vs E4	6.42(0.690)	6.76(0.608)	0.34	0.009	-2.43
6	F3 Vs F4	5.96(0.520)	6.24(0.679)	0.28	0.013	-2.26

** P value is obtained by T-Test Calculator for 2 Independent Means

Table 3. Responses for Perception of students to the new teaching learning methods

Items	N = 90, (Percentages)				
	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1) The method improves my learning.	77 (85.6)	13 (14.4)	0	0	0
2) The method is helpful for understanding the topic.	82(91)	8(9)	0	0	0
3) This method motivated me to learn.	56(62.2)	19(21.1)	14(15.6)	1(1.1)	0
4) I am satisfied with the method.	67(74.4)	22(24.4)	1(1.1)	0	0
5) I like use of cinema to explain concepts in forensic medicine.	72(80)	16(17.8)	2(2.2)	0	0
6) I would like this teaching method to be applied in the Forensic curriculum.	68(75.6)	22(24.4)	0	0	0
7) This method adds too much burden and pressure.	0	0	1(1.1)	11(12.2)	78(86.7)
8) This method occupies too much of my spare time.	0	0	3(3.3)	21(23.3)	66(73.3)
9) I need to spend a lot of energy on this method.	0	0	2(2.2)	10(11.1)	78(86.7)
10) This method has improved my concentration.	60 (66.7)	19(21.1)	10 (11.1)	1(1.1)	0

Almost all the participants were satisfied with the new method except for 1.1 % who gave a neutral response. 2.2 % of the participants gave a neutral response, when asked if they would like the use of cinema to explain the concepts in Forensic Medicine while rest of the participants agreed for it. All the participants agreed when asked if they would like this method to be applied in Forensic Curriculum. 1.1 % gave a neutral response, when asked if the new method is adding burden and pressure while the rest of the participants disagreed for it. When asked if the method is occupying too much of their spare time 3.3 % of the participants gave a neutral response while the others disagreed.

When asked if they have to spend lot of energy on this method 2.2 % of the participants gave a neutral response while the others disagreed. When asked if the new method has improved their concentration while learning the topics 1.1% of the participants disagreed and 11.1 % gave a neutral response to it, while other participants agreed.

Over all the new method of teaching along with movie/video clips was well accepted by the students as it is evident from the scores of the post test, long term memory retention and perception of the students.

DISCUSSION

Few scientific studies have been published about cinemeducation and its impact on learning. We found no study of others' experiences using feature film to enhance learning in Forensic Medicine (6-8) The result of the present study showed that teaching activity was effective in improving students' understanding of Forensic Medicine and vast majority of the students were satisfied with the activity. The difference in the scores can be attributed to the teaching activity and indicates gain in knowledge.

In a study titled Cinemeducation, a pilot student project using movies to help students learn medical professionalism by N. Lumlertgul et al. published in 2009 it was observed that In the Cinemeducation Project, medical students have learned five main ethical issues in each film, which were the doctor-patient relationship, informed consent and clinical trials in patients, management of genetic disorders, patient management, and brain death and organ transplantation. In addition to issues of professionalism, they also developed critical thinking and moral reasoning skills. The study concluded that using a case-based scenario in movies has proven to be an effective and entertaining method of facilitating students with learning on professionalism (9).

In a publication titled Cinemeducation: Teaching end-of-life issues using feature films in *Journal of Gerontological Nursing*, September 2009, by Mary C. DiBartolo and Lisa A Seldomridge it was concluded that given the growing aging population and the need for professional nurses who are well-versed in EOL care, educators are challenged to help students master essential content about palliative care and promoting quality of life, as well as wrestle with their own feelings about death (10).

The use of feature films in instruction is one strategy to meet these goals, as cinema creates a connection with characters that goes well beyond what can be achieved in a textbook case. Movies can provide a means for self-exploration in a

non-threatening environment (Sharp et al., 2002) (11) and serve as a springboard for insightful discussion. Creating assignments that use relevant feature films promotes a more thorough understanding of human behavior, generates an overall emotional reaction, and helps foster the development of values of caring, autonomy, and human dignity (Morris & Faulk, 2007) (12), all of which are vital in becoming skilled in EOL care.

In a study titled "Cinemeducation in clinical pharmacology: using cinema to help students learn about pharmacovigilance and adverse drug reactions" done by Irene Cambra-Badii et. al. (13) they observed that out of 237 student participants, postintervention assessment scores were significantly higher than preintervention scores for the entire population and for all subgroups. The mean number of correct answers was 4.41 on the preintervention assessment and 5.78 on the postintervention assessment. Similar results have been observed in the present study where the cinema was used as a teaching tool along with traditional teaching methods and the students scored higher and also performed better in long term retention of the knowledge.

Some authors recommended working with an entire film (14) while other authors have recommended using clips from the movies to generate curiosity and discussions (2,10) In the present study clips were selected from the movies that were related to the subject of Forensic Medicine and topics selected for the study. The information derived from the present study will help in future research in qualitative and quantitative research on classroom teaching methods.

The main limitation of this study was time constraint and for the same reason entire movie was not shown to the students and feedback was not given to the students. One more limitation observed was the language barrier in some movies. Since only topics related to Forensic Medicine were chosen, effectiveness couldn't be studied in other branches.

In conclusion, cinemeducation is an effective and entertaining method of helping medical students learn. It is an effective auxiliary tool to traditional teaching learning methods for teaching Forensic Medicine to undergraduates. There were statistically significant changes in immediate learning of the participants in 5 out of 6 sessions. Long term memory retention was statistically significant in all the sessions where movies were used in teaching. Overall perception of the students towards a teaching learning method along with a movie clip/ video was in favor of using cinema as a medium to facilitate learning and long-term memory retention.

The literature about using cinema as a teaching tool in medicine still lacks the systematization and detail critical to provide a solid theoretical basis for this approach, and present study and more such studies are needed to provide experimental data to establish its pedagogical value.

The study may be conducted for some more topics. It can also be conducted in multiple departments. The perception of faculty members on the use of Cinemeducation to teach Forensic Medicine can be collected.

Ethical Considerations: Ethical issues including plagiarism,

informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc. have been completely observed by the authors. Human ethics approval was obtained before starting the study, approval no: KMC/IHEC/05/2019. Identities of the

participants was kept anonymous. Informed consent was obtained from all Participants before starting the study.

Financial Support: None

Conflict of interest: None

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