

The Role of Animated Videos in Bridging Pharmacology and Clinical Correlation in Medical Education

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Abstract

Keywords:

Curriculum, Clinical

Correlation, Pharmacology,

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Background: In this era of Competency based medical education (CBME), there is need to develop competency among medical students to understand and correlate theoretical knowledge of pharmacological action of drugs to their clinical application. In this project we introduced animated videos to the 2nd year MBBS students for showing pharmacological actions of drugs and checked their clinical correlating ability followed by feedback.

Aim and Objectives: To Introduce animated videos in pharmacology to enhance understanding of clinical correlation of the drugs under study

Methodology: The study was conducted on 2nd professional MBBS Students in Department of Pharmacology BPS ,GMC for Women Khanpur Kalan, Sonipat from June 2018 to August 2018. The total of 100 students were in five groups of 20 students each. Each group was allotted one drug and was instructed to search 2 videos showing pharmacological action of allotted drug. Committee of faculty members collectively selected and validated 5 videos (one for each drug) out of total of 10 videos. These 5 selected videos (showing Pharmacological action of five drugs) were discussed with students. Validated activity performed for clinical correlation was filled by each student in the hospital by observing the patients findings. The perceptions and preferences of students were recorded on self structured, prevalidated questionnaires using 5 point Likert scale.

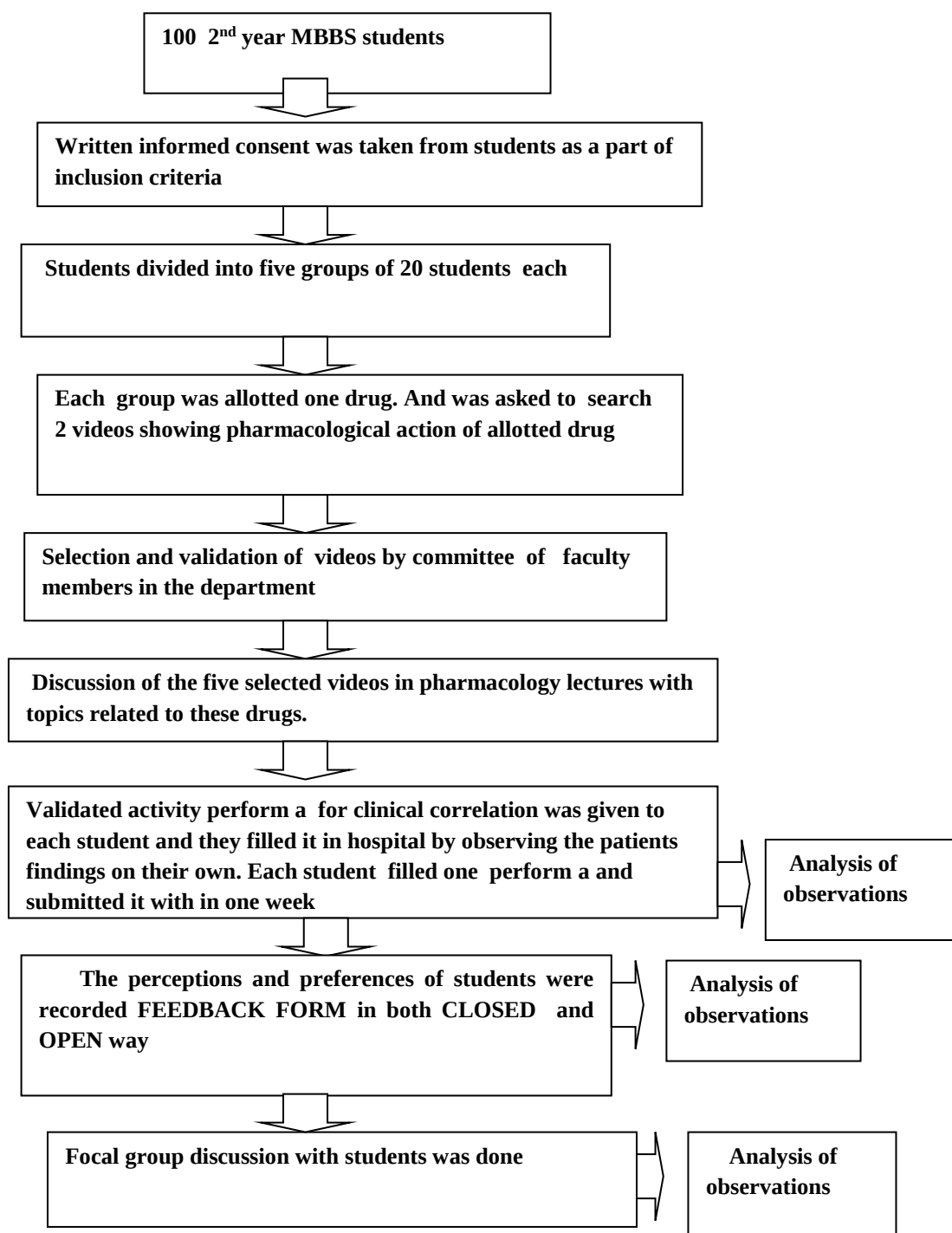
Findings: More than 90% students gave feedback that introduction of videos in pharmacology lectures increased their interest, improved their understanding and increased their retention pertaining to the topics covered under this project. More than 85% students responded that these videos also helped them to correlate clinically the theoretical knowledge of drug with the pharmacological action of drugs. 99% of students felt that searching videos for a particular topic was time consuming

Conclusion: Animated videos can be incorporated in curriculum of pharmacology, as a tool for increasing understanding, knowledge and retention of the students and for increasing their ability to clinically correlate the pharmacological action of drug.

Introduction

Understanding and clinically correlating the pharmacological action of various drugs has always been problematic area for students. Knowing pharmacological actions of various drugs is important as it is directly related to the usefulness of drug. Also if a student understands the pharmacological action of drug, then it would be easier for him/her to understand the clinical uses & adverse drug reactions of that drug. Students usually make their own imaginations as to how these drugs act, on which targets and how they would be helpful clinically. Multimedia materials improve the understanding through the activation of verbal and visual cognitive processes concurrently. By using multimedia there is activation of higher cognitive activity, enhanced retention and more understanding of contents.[1] In this project we introduced animated videos to the 2nd year MBBS students for showing pharmacological actions of drugs and checked their clinical correlating ability followed by feedback.

MATERIAL AND METHODOLOGY: The study was conducted on 2nd professional, 3rd semester MBBS Students in Department of Pharmacology BPS ,GMC for women Khanpur Kalan, Sonipat from June 2018 to August 2018. It was a prospective interventional study. Prior permission from Institutional Ethics Committee and Head of the department of pharmacology was taken. The study was completed in following steps:



Results and discussion

A total of 100 (volunteers) MBBS second professional students participated in the current study at BPS, Govt. Medical College for Women, Khanpur Kalan Sonipat. Out of 100 participants, 96 students returned activity performas, four students lost up in follow up. The observation and results of activity performas, feedback form and focal group discussion done in study are:

Results from the activity performa: (Fig 1 & Fig 2)

Fig. 1 :Drugs(%) showing change in sign and symptoms of patients as observed by students clinically

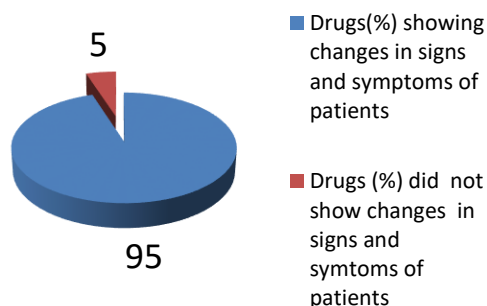
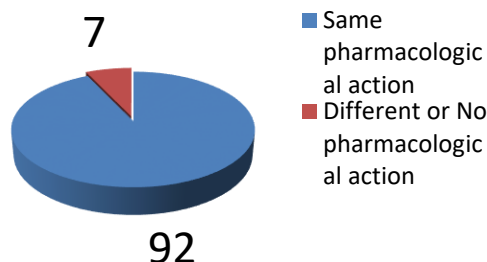


Fig. 2: Drugs(%) in patients showing the same pharmacological action as in videos (student self interpretation)



Results from the students feedback form: (Fig 3, Fig 4 & Fig 5)

As there were two types of questionnaire in feedback form: closed ended and. open ended .

Fig.3:Results from closed ended questionnaire

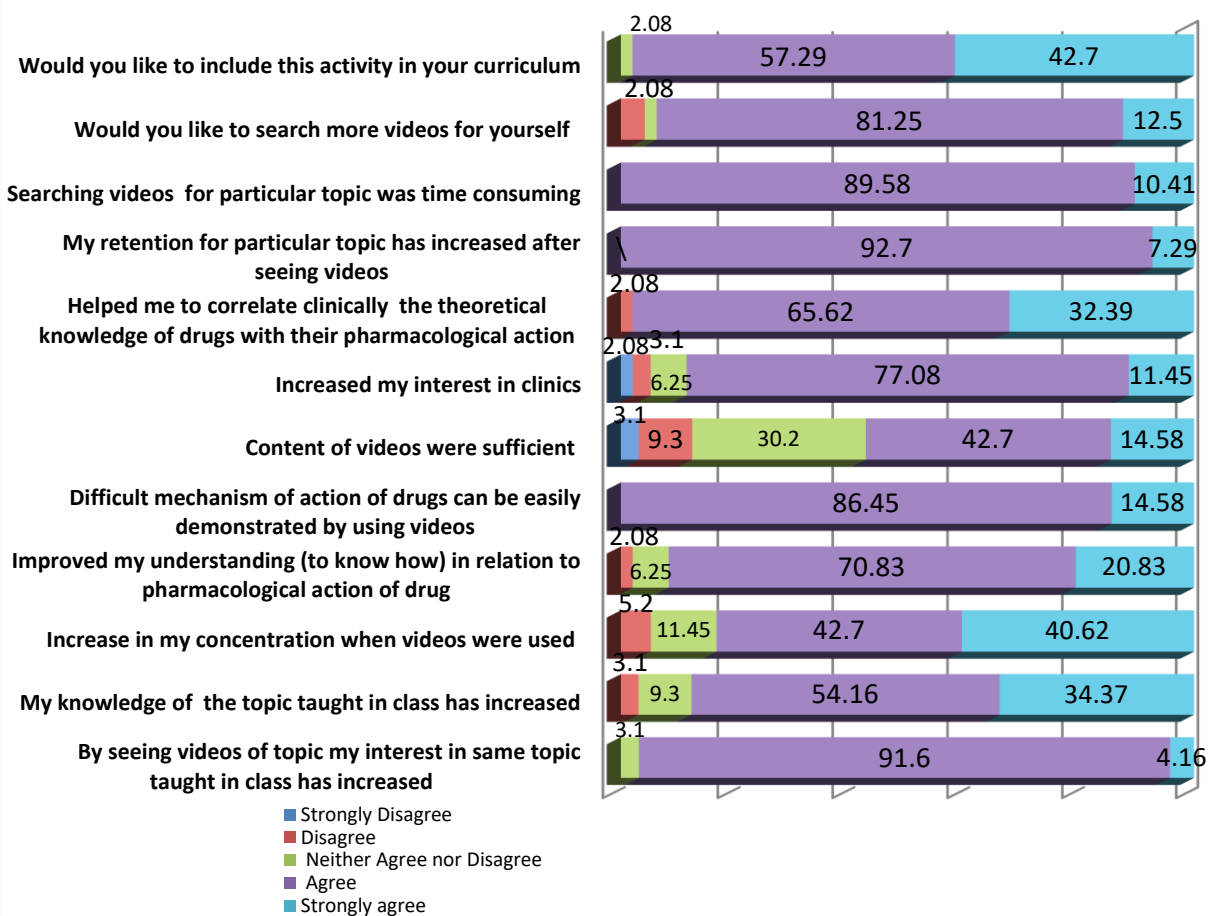


Fig. 4 : Compilation of Positive feedback from open ended questionnaire

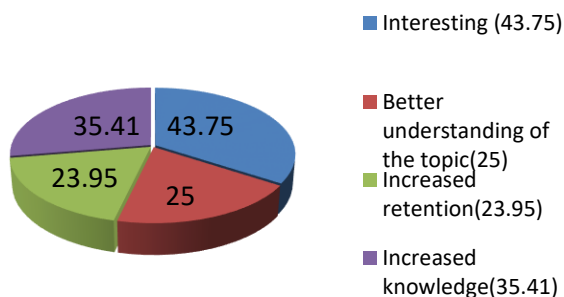
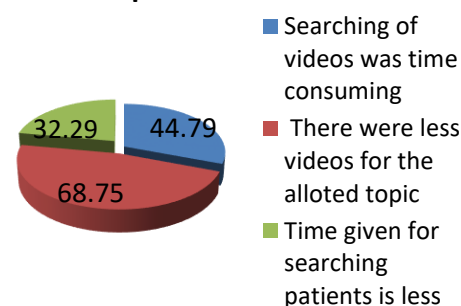


FIG 5: Compliation of Negative feedback from open ended questionnaire



Results from focal group discussion:Fig 6

Fig: 6:Students statements pertaining to the introduction of videos in pharmacology and their clinical correlation during focal group discussion

The positive verbatim quotes are:

"The videos shown for the projects are really increase my understanding"

"By seeing videos we understand more rather than cramming"

"Now we have ideas how to search videos for other topics"

"By seeing videos topics are retained more"

"More videos should be included for more topics"

The negative verbatim quotes are:

"It was time consuming to search good quality videos for particular drug"

"Searching patients for particular drug also was time consuming"

"Problems at the time of examination for revision because of time"

COGNITIVE DOMAINS	FINDINGS FROM THE INSTRUMENTS (ACTIVITY PERFORMA, FEEDBACK QUESTIONNAIRE AND FOCAL GROUP DISCUSSION) USED IN THE STUDY
Remembering	Helped the students to retained the pharmacological actions of drugs
Understanding	Helped the students to understand the pharmacological action of drugs
Applying	Students appreciated changes in signs and symptoms of patients in more than 90% of drugs observed.
Analyzing	Helped the students to correlate the theoritical knowledge of drugs with their clinical application
Evaluating	Students interpret that more than 90% of drugs have shown same action as seen in videos.
Synthesis	Students planned to search for more videos of other drugs 1.For clinical correlation of pharmacological actions 2. For clinical correlation of pharmacokinetics

Fig :7 Blooms revised cognitive domains in relation to findings of the study

In this study we introduced animated videos showing pharmacological action of drugs. This was followed by filling of activity performa and taking feedback in form of feedback form and focal group discussion. Overall feedback of this project was positive from students with some suggestions. The students gave feedback that there is improvement in their understanding, knowledge and retention of the topics that were covered in the videos. This suggests that videos for learning and understanding pharmacology was widely accepted among the participants. In activity

performa, students found that they observed 95% of drugs have shown change in sign and symptoms of patients. The reason for 5% drugs not affecting the symptoms may be due to wrong diagnosis of the disease, underdose etc. As far as self interpretation of students about the clinical correlation of drugs is concerned, 92% students admitted that pharmacological action of drugs are same as seen in videos and 7% students were not able to correlate. The reason for it may be the poor understanding or poor retention of the students. To the best of our knowledge we have not found any study correlating introduction of videos to clinical application. In our study more than 90% students gave feedback that introduction of videos in pharmacology increased their interest in the topics covered under this project and improved their understanding in relation to pharmacological action of drugs. Prensky (2005) also suggested that especially young students are receptive to video content because they find it attractive and this benefits them in one way or the other in the learning process.[2] It is also proven that learning, through the use of video technology have an impact on the understanding of dynamic events.[3] Here in our study more than 90% of students gave feedback that videos helped them to correlate clinically the theoretical knowledge of drugs with their pharmacological action of drugs. South et al. 2008 also suggested that video can connect knowledge to relevant tasks, activities, contexts, as well as cultures in which it is used.[4] A number of studies have opined that the combination of audio and visual information in material promotes better retention, than those presented through a single information source.[5] In a study of 147 psychology students it was found that videos were more effective mode of instruction than text for presenting real-life situations in order to enhance the learner's comprehension, retention and satisfaction. [6] Here in our study also more than 98% students agreed that by seeing videos their retention for same topic has increased. It is worth noting that many students gave the negative feedback about the project. 68.75% students said time given for searching patients was less. The actual reason was there was a time constraint for completion of project. 44.79% students commented that searching videos was time consuming. This is because there is scarcity of good quality videos in the vast ocean of internet. But once we standardize videos then it will be easier to use them further. Also it is searching of videos which improve the self directed learning of students. In focal group discussion the students gave both positive and negative feedback and was audio recorded. In positive feedback students commented that videos increased their understanding, retention and reduced cramming and on negative aspect both searching and seeing videos was time consuming. Also may face problem in revision of videos during examinations. Students also gave suggestions that content and quality of videos should be maintained. If we tried to correlate our study findings in relation to the revised blooms cognitive domains then these findings fits into all the corresponding domains as shown in fig 7.

In this study we introduced videos for understanding pharmacological action of drugs and their clinical correlation. Pharmacology is one of the toughest subject of 2nd year MBBS students. One of the main reason for it is the current curriculum and based on that various text books of pharmacology which are stuffed with lots of theoretical information but are largely lacking in clinical correlation or application of pharmacology. By this study it is clear that good quality videos make the students understand better and correlate pharmacology clinically. By searching the videos there is also motivation in students to search more videos resulting in self directed learning.

Conclusion

Animated videos can be incorporated in curriculum of pharmacology, as a tool for increasing understanding, knowledge and retention of the students and for increasing their ability to clinical correlate the pharmacological action of drugs.

Acknowledgement

Nil

References

1. Fee A, Budde-Sung AEK. Using video effectively in diverse classes: what students want. J. Manag. Educ. (2014); 38(6):843–874.
2. Prensky M. Listen to the natives. Educ. Leadersh. (2005); 63:8–13.
3. Duffy TD, Cunningham DJ. Constructivism: implications for the design and delivery of instruction, in Handbook of research for educational communications and technology: a project of the association for educational communications and technology, ed. by D.H. Jonassen (Macmillan, New York, 1996), pp. 55–85.
4. South JB, Gabbittas B, PF Merrill. Designing video narratives to contextualize content for ESL learners: a design process case study. Interact. Learn. Environ. (2008);16(3):231–243.

5. Nugent GC. Pictures, audio, and print: symbolic representation and effect on learning. *Educ. Comm. Tech. J.* (1982);30(3):163–174.
6. Choi HJ, Johnson SD. The effect of problem-based video instruction on learner satisfaction, comprehension and retention in college courses. *Br. J. Educ. Technol.* (2007);38(5):885–95.

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