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RESEARCH ARTICLE

EFFECT OF VIDEO LECTURES IN COMPARISON WITH TEXT READING ON MEMORY RETENTION AMONG MEDICAL STUDENTS: A RANDOMISED CONTROLLED TRIAL, AURANGABAD, MAHARASHTRA, INDIA

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Abstract

Background: For most of the competitive exams, students have opted for online education rather than traditional modes of education. But very few studies are conducted on memory retention amongst students with traditional study methods and this newer study method. So, this research is aimed to compare the effectiveness of video modules and conventional text reading methods on medical students' memory consolidation.

Objectives: To compare the effectiveness of video lectures against reading materials in memory retention among medical students.

Material & Methods: 100 medical students after obtaining their consent were included and randomized into two comparable groups. The groups were given either a video or text-based learning module on the demographic cycle. A test was held immediately, consisting of ten multiple-choice. The test was repeated in the second and fourth week. Both descriptive and inferential statistics were utilized. The mean score difference between the video and control groups was determined using a two-tailed unpaired t-test. Also, to test whether there were differences in memory recall between the two genders, data were analyzed using unpaired t-test.

Results: Participants from the video-based learning method had statistically significant higher marks compared to participants who underwent the text reading method. Female participants scored slightly higher in memory recall.

Conclusion: Video-based learning method is more effective in medical students' memory retention compared to the text reading method.

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Introduction:-

The ability to recall involves the process of bringing information stored in memory into conscious awareness during simple expression, narration, and comprehension of information.¹ With the increased availability and speed of the Internet come new ways of disseminating interactive multimedia learning modules and possibilities for integrating information and communication technologies into other methods of teaching and learning.² Education means, learning, teaching, or the process of acquiring skills or behavior modification through various exercises.³ Education is a dynamic process that has to be refined periodically. The lack of innovative teaching techniques in academics makes medical curricula inadequate in making a significant stride toward the future.⁴

Medical education has changed significantly over time. The changes are linked not only to changes in educational technology and the advancement of medical knowledge but also in educational concepts and curricula.⁵ Traditionally, medical education meant the transferring of knowledge and skills from educators to students. Health professionals enable students to contact their teachers and refer to the appropriate literature including oral and practical techniques. The extended use of digital devices including laptops, tablets, mobile phones and smartphones for many purposes influenced data sharing and experience distribution, including formal and non-formal education in the last decades.⁶ Medical education is moving toward active learning, with different teaching and learning techniques.⁷ Information and communication technology can be used as a powerful tool for improving the quality and efficiency of education.⁸ To prepare qualified doctors for today's environment in which the internet provides ubiquitous digital information, the teaching methods used for educating and training medical school students should be reconsidered. Offline learning, or traditional classroom teaching, represents teaching in the pre-internet era.⁹ For most competitive exams, students have opted for online education rather than traditional modes of education.¹⁰

Among the technological media available in education, videos stand out because of their easy accessibility and unique capabilities, such as enabling the watching of cases repeatedly and providing comprehensive examples of nonverbal behaviors through voice, text, and body language.⁷ Marrow, Prepladder, and Medscape are the top medical applications used for NEET-PG preparation these days.¹¹

Although in literature, video-based education has been used as an effective teaching tool for psychomotor skills development in medical students, there is no clear evidence to show its superiority to increase the level of skill acquisition among learners over traditional methods. This is since many of the previous studies used survey questionnaires to assess the reaction and perceptions on acceptance, satisfaction, and usage of such tools among learners.¹² Hence, the present study was planned to assess knowledge retention following a text reading and following a video-based lecture.

Methodology:-

This is a randomized controlled trial comprising two different groups of participants to determine any difference between the retention ability for text reading and a video-based lecture.

The study was conducted from 1st August 2022 to 1st April 2022 at Government Medical College and Hospital, Aurangabad, Maharashtra, India. The participants were 100 first-year medical students, consisting of 50 males and 50 females, who volunteered to take part in the study. The convenience sampling method was used to select the participants. Informed consent from participants was obtained. The lottery method was used to assign the students to their respective groups with equal numbers of males and females in each group thus, eliminating the selection bias. Single blinding was done to eliminate any bias. The first group attended a video lecture on the demographic cycle while the control group was given a text-based article on the same topic. The video was displayed twice which took around 15 mins and text was given for 15 mins and students were asked to read it twice.

A test consisting of ten multiple-choice questions was held immediately after the session. An equal amount of time was given to both groups thus. The test was repeated in the second and fourth week. One mark was given for each correct answer. Continued follow-up of participants was done to avoid attrition bias. Therefore, there were no dropouts.

Analysis:-

The data was processed in MS Excel. Both descriptive and inferential statistics were calculated. The mean score difference between the video and text groups was determined using a two-tailed unpaired t-test. Also, to test whether there were differences in memory recall between the two genders, data were analyzed using unpaired t-test. A P-value of less than 0.05 was considered statistically significant.

Results:-

The total number of first-year medical students who agreed to participate in the current study was 100. Participants were randomly assigned to either the text-reading group or the video-based lecture.

Table 1:- Gender distribution according to the type of intervention (n=100).

Gender	Text-reading n(%)	Audio-visual n(%)
Male	25 (25%)	25 (25%)
Female	25 (25%)	25 (25%)
Total	50 (50%)	50 (50%)

Table 2:- Total marks of text reading group in comparison to the video-based lecture group at different time intervals (n=100).

Groups	Mean	Standard deviation	p-value
Session 1(immediately)			
Group 1(text reading)	9.08	0.88	0.09
Group 2(video lecture)	9.32	0.91	
Session 2(Second Week)			
Group 1(text reading)	6.78	1.15	0.001*
Group 2(video lecture)	7.52	1.11	
Session 3(Fourth Week)			
Group 1(text reading)	6.48	1.58	0.001*
Group 2(video lecture)	7.38	1.24	

As shown in Table 2, the video group scored significantly higher than the text-reading group in the tests conducted immediately, two weeks, and four weeks later. It also shows a marked progressive decrease in the mean score of the text-reading group. The mean score also decreased in the video group but only slightly decreased in the subsequent tests. The difference between the video-based learning method and the text-reading method was found to be statistically significant in the second and fourth week.

Discussion:-

This study found that participants who had video-based lecture sessions had statistically significant higher marks in single-response answer questions compared to participants who read the text. Similar findings were seen in the study done by Vanichvasin P, Piller et al.^{13,14} Study done by Kamin C, et al. identified that the video was higher than the text critical thinking ratio for undergraduate students.¹⁵ In contrast to this finding the study done by Borup J, et al.¹⁷ and Woodham L A¹⁶, et al. suggested that the efficiency of text is more than the benefits of video.

Participants from the video lecture group retained the information to a higher degree and it was easier to recall answers. These results support previous research in 2010 by Means et al.¹⁸ and multiple studies have shown that video, specifically, can be a highly effective educational tool (Kay R H, 2012, Stockwell et al., 2015, Brame CJ, 2016, Slemmons K et al.).^{19, 20, 21, 22} A study on the text-based versus video discussions among graduate students from a large private university in the United States and undergraduate students from an urban college in Canada done by Murphy J, et al. In 2021 illustrated that students perceived more when using video-based discussions.²³ Ludwig S, et al. suggested in their study to teach medical students wisely that video-based training is marginally more effective than text-based training in the long-term retention of memory.²⁴ Whereas, a study done by Paul J et al. suggested there was no significant difference in student performance between online and face-to-face learners.²⁵ Merkt et al. also found no difference in comprehension outcome between video and reading.²⁶

Conclusion:-

The video-based learning method is more effective than the conventional text-reading method on medical students' memory retention. Hence The video-based learning method could be promoted in medical education as an additional tool/teaching method to improve medical students' memory retention.

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Conflict of interest:

None declared.

Ethical approval:

Institutional ethical approval was taken

Trial Registration:

Not applicable, because this article does not contain any clinical trials.

Reference:-

1. Mehnaz A, Baig L A, Aly S M. Difference in memory recall among medical students after reading text (hard copy) vs. on screen text (soft copy). *Journal of Pakistan Medical Association*.2021; 71(5): 1450-1454.
2. Dørup J. Experience and attitudes towards information technology among first-year medical students in Denmark: longitudinal questionnaire survey. *Journal of Medical Internet Research*. 2004;6(1):10.
3. Masic I, Pandza H, Toromanovic S, Masic F, Sivic S, Zunic L, Masic Z. Information Technologies (ITs) in Medical Education. *Acta Inform Med*. 2011;19(3):161-7.
4. Challa K T, Sayed A, Acharya Y. Modern techniques of teaching and learning in medical education: a descriptive literature review. *MedEdPublish*. 2021;10.
5. Qiao YQ, Shen J, Liang X. Using cognitive theory to facilitate medical education. *BMC Med Educ*. 2014;14:79.
6. Al Sayed I, Al-Saiyd N. The Impact of Information Technology in Medical Education. 2019; 1-9.
7. TaslibeyazE, AydemirM, Karaman S. An analysis of research trends in articles on video usage in medical education. *Education and Information Technologies*. 2017;22.
8. Vakilian A, Ranjbar EZ, Hassanipour M, Ahmadiania H, Hasani H. The effectiveness of virtual interactive video in comparison with online classroom in the stroke topic of theoretical neurology in COVID-19 pandemic. *J Edu Health Promot*2022;11:219.
9. Leisi P, Hongbin W. Does online learning work better than offline learning in undergraduate medical education? A systematic review and meta-analysis, *Medical Education Online*. 2019; 24:1-13.
10. Nimavat N, Singh S, Fichadiya N, Sharma P, Patel N, Kumar M, Chauhan G, Pandit N. Online Medical Education in India - Different Challenges and Probable Solutions in the Age of COVID-19. *Adv Med EducPract*. 2021;12:237-243.
11. Chauhan S S, Kasulkar A A. Knowledge and practice of Smart phones and medical-related applications in learning by medical undergraduates. *Public academy of Forensic Medicine & Toxicology*.2021 Apr;21(1):192-196
12. Padmavathi R, Abirami O, Kumar AP. Video demonstration as a teaching-learning method for a core clinical skill among undergraduate medical students: An interventional study. *Natl J Physiol Pharm Pharmacol*. 2019; 9(6): 547-550.
13. Vanichvasin P. Effects of Visual Communication on Memory Enhancement of Thai Undergraduate Students, Kasetsart University. *Canadian Center of Science and Education*. 2021; 11 (1): 34-41.
14. PillerY, Ponnors P. Video-Based vs. text-based Instruction in Asynchronous Learning Environment and Their Effect on Students' Perception of the Course quality.2015; 3-26.
15. Kamin C, O'Sullivan P, Deterding R, Younger M. A comparison of critical thinking in groups of third-year medical students in text, video, and virtual PBL case modalities. *Acad Med*. 2003 Feb;78(2):204-11.
16. Woodham LA, Ellaway RH, Round J, Vaughan S, Poulton T, Zary N. Medical Student and Tutor Perceptions of Video Versus Text in an Interactive Online Virtual Patient for Problem-Based Learning: A Pilot Study. *J Med Internet Res*. 2015;17(6):151.
17. Borup J, West R, Thomas R. The impact of text versus video communication on instructor feedback in blended courses. *Educational Technology Research and Development*. 2015; 63.
18. Means B, Toyama Y, Murphy R, Bakia M, Jones K. Evaluation of Evidence-Based Practices in Online Learning: Meta-Analysis and Review of Online Learning Studies. Washington, DC: US Department of Education. 2010;1-55.
19. Kay RH. Exploring the use of video podcasts in education: a comprehensive review of the literature. *Comput Human Behav*. 2012;28:820–831.
20. Stockwell BR, Stockwell MS, Cennamo M, Jiang E. Blended learning improves science education. *Cell*. 2015;162:933–936
21. Brame CJ. Effective Educational Videos: Principles and Guidelines for Maximizing Student Learning from Video Content. *CBE Life Sci Educ*. 2016;15(4):6.

22. Slemmons K, Anyanwu K, Hames J, Grabski D, Mlsna, J, Simkins E, Cook P. (). The Impact of Video Length on Learning in a Middle-Level Flipped Science Setting: Implications for Diversity Inclusion. *Journal of Science Education and Technology*. 2018; 27:1-11.
23. Murphy J, Swartzwelder K, Serembus J, Roch S, Maheu S, Rockstraw R, Leggieri A. TEXT-BASED VERSUS VIDEO DISCUSSIONS TO PROMOTE A SENSE OF COMMUNITY: AN INTERNATIONAL MIXED-METHODS STUDY. *JOURNAL OF EDUCATORS ONLINE*. 2021; 18 (3).
24. Ludwig S, Schuelper N, Brown J, Anders S, Raupach T. How can we teach medical students to choose wisely? A randomised controlled cross-over study of video- versus text-based case scenarios. *BMC Medicine*. 2018;16:2-9.
25. Paul J, Jefferson F. A Comparative Analysis of Student Performance in an Online vs. Face-to-Face Environmental Science Course From 2009 to 2016. *Front. Comput. Sci.*, 2019; 1(7): 1-9.
26. Merkt M, Weigand S, Heier A, Schwan S. Learning with videos vs. learning with print: The role of interactive features. *Learning and Instruction*. 2011; 21:687-704.