

Benefits of audio podcast as a supplement to didactic lecture for 1st year medical students

Shivananda Kalludi N

¹Professor and Head, Department of Physiology Akash Institute of Medical Sciences and Research Centre Bengaluru, Karnataka, INDIA

Email: hellodrshivanand@gmail.com

Abstract

Background: Podcasts are digital recording of information in media player which are uploaded to a website and distribution of these files to students via internet. The potential advantages of audio podcasts are that it can be easily downloaded and heard frequently. Since the students of current generation are familiar with computers and new technology, podcast would help them to understand and revise subject information. **Objectives:** This investigation was performed to evaluate the benefits of audio podcast in first year medical students and student's attitude towards audio podcast as a supplement to didactic lecture. **Materials and Methods:** A cross-sectional study was conducted by recruiting first year medical students. A didactic lecture was conducted and participants (N=148) were divided into two groups by random sampling. Participants belonging to group B (N=73) underwent a podcast session for 15 minutes followed by an assessment. This was followed by participants feedback pertaining to the benefits of podcast. Participants belonging to group A (N=75) were provided handouts of the didactic lecture and had a study session for 15 minutes. This was followed by an assessment. Participants were then involved in the podcast session followed by feedback to assess perceived utility of podcast. Mann Whitney U test was used to compare the difference in scores obtained by an assessment between two groups. **Results:** The findings revealed a similar influence ($p=0.576$) in the median multiple choice question score of participants in the intervention (group B) and the group which received handouts of didactic lecture. **Conclusions:** The current investigation provides benefits of audio podcast like it enables participant to hear lectures repeatedly and helped in understanding the physiology topic better. In addition when didactic lectures are supplemented with audio podcast, it would enhance participant's performance in examinations.

Key Word: audio podcast, video podcast, aural learning, didactic lecture, mobile learning

*Address for Correspondence:

Dr. Shivananda Kalludi N Professor and Head Department of Physiology Akash Institute of Medical Sciences and Research Centre Bengaluru- 562110, Karnataka, INDIA

Email: hellodrshivanand@gmail.com

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INTRODUCTION

Multiple teaching-learning methods are gaining popularity to increase the retention of facts and their recall in the clinical situation.¹ Teaching-learning methods include didactic lecture, self-directed learning, problem-based learning, student seminars, symposiums

and team-based learning.² Teaching learning tools like power point presentation is well known in India. Online digital resources are playing an integral role in the disruption of medical education and it includes Wikis, blogs, CD-ROMs and podcasts.³ The increased popularity of portable media players has made podcasting a feasible option for professors to distribute course lectures to students.⁴ The strength of podcast is to provide mobile learning.⁵ The term podcast was coined in 2004 to refer to audio files downloaded using Real Simple Syndication software and played on portable audio or video players.⁶ Podcasts are digital recording of information using a media player in MP3/MP4 format which are uploaded to a website and dissemination of these files to health educators and students via internet.⁷ Numerous devices are available to download these files like iPod, tablet, smart phone and personal computer. Admitting didactic lectures are widely used, a study observed "didactic

lectures fails to keep the attention of students for a longer time, failed to address people having different learning styles and preferences".⁴ The availability of rapidly advancing technologies have paved to a number of possibilities in relation to the teaching and learning environment to students.⁸ The potential advantages of podcasts include distance learning opportunities and the same content can be accessed multiple times for reinforcement.⁹ Conflicting reports have been published pertaining to benefits of podcasts. A senior lecturer in microbiology at Bradford University is in favor of podcasts when compared to live lectures.¹⁰ Academics need to foresee the introduction of instructional methods such as podcasts lectures.¹¹ Audiovisual podcast can be incorporated into undergraduate education as a revision aid.¹² A study observed podcasts are more engaging than a textbook but less engaging than a live lecture.¹³ In addition students found difficulty in searching through podcasts and loss of interaction with lecturer to clarify their doubts made podcasts less engaging. The purpose of this study was to evaluate benefits of audio podcasts to first-year medical students and perception of student's attitude towards audio podcasts as a supplement to didactic lecture.

MATERIALS AND METHODS

Preparation of podcasts and feedback questionnaire One faculty from the department of physiology scripted the content for podcast preparation. The topics included in the podcast were 1) waves obtained in electroencephalography, 2)uses of electroencephalography, 3)physiology of sleep, 4)sleep promoting peptides and 5)disorders of sleep like somnambulism and narcolepsy. Recording was done using a laptop connected to headphone in a quiet room to avoid background noise. The Audacity software was downloaded to the laptop from internet (filehippo.com/download_audacity). There were two audio clips in the podcast, each lasting for approximately six minutes. With intention to assess participant's attitude towards advantages of podcasts as a supplement to didactic lecture in the curriculum, a questionnaire was used. The questionnaire contained eight statements and these statements were e-mailed to five physiology department faculty members for validation. One statement required modification and modified accordingly in the final questionnaire. Adopting a numerical classification procedure, five-point Likert-type statements were scored from 1 (strongly disagree) to 5 (strongly agree) for positive statements (statements numbered^{1,2, 3} and 4) and from 1 (strongly agree) to 5 (strongly disagree) for negative statements (statements numbered^{5, 6,7} and 8). Participants and study design In the present

study, first year medical students were informed one week prior about the study and encouraged to take part in the study as it involved two important topics of physiology namely electroencephalography and physiology of sleep. The goals of the study were explained to them. This cross-sectional study was conducted in the year 2017 after obtaining permission from Institutional Ethics Committee (project code RP-001/2017). Out of the 150 students joined in the first year medical course curriculum, 2 students were not feeling well and hence both participants were excluded from the study. Remaining 148 participants agreed and were included in the study. All participants had passed national eligibility entrance test before entering bachelor of medicine and bachelor of surgery. All 148 participants had English as medium of instruction till twelfth standard and completed an informed written consent prior to the beginning of the study. Participation in the study was voluntary and conducted in the lecture halls of medical college in March 2017. Study was started in March 2017 and completed in May 2017. Synopsis of study design has been presented in Figure 1. Procedure All participants (N=148) underwent a didactic lecture for 25 minutes and were divided into two groups (group A and B) by random sampling using lottery method. Students in group B experienced a podcast session using their smart phones with headset in a different lecture hall of the same institute for 15 minutes, then attended Multiple Choice Question (MCQ) test. Then participants marked in the questionnaire pertaining to feedback about the audio podcast. Students belonging to group A continued to stay in the same hall after completion of didactic lecture and were provided with the handouts on same topic of didactic lecture and were asked to study handouts for 15 minutes. Participants in the group A then attended MCQ test, listened to podcast using smart phone and conveyed their feedback by marking in the statements of questionnaire. Multiple Choice Question test was conducted at same time for both groups to prevent distribution of questions.

Statistical Analysis:

The data was compiled using Microsoft Excel and analyzed using SPSS version 16.0 for Windows (SPSS Inc., Chicago, Illinois). In order to test the normalcy of MCQ test scores in two groups, Kolmogorov-Smirnov test was used. Since the data of MCQ test scores were found to deviate from normalcy, Mann-Whitney U test was applied to compare significance of difference in the median MCQ scores between two groups and $p < 0.05$ was considered as statistically significant.

RESULTS

The average age of the students in the intervention (group B) group was 18.2± 0.434 years and control group was 18.12±0.589 years. In the present study the total score for the MCQ test was 8 marks and one mark was allotted for each question with correct response. There was no negative marking for inaccurate response. Mann Whitney U test was performed to find the significance in MCQ test scores between two groups. There was no significant difference between intervention and control group (p= 0.576). An overall mean attitude score of 3.83 was obtained for the questionnaire after combining both the

groups (n=148). The statements and mean attitude score for individual statement is presented in Table 2. It was observed 94% of students felt that understanding of topic was better due to podcast listening after the didactic lecture. The students had positive attitude towards utility of audio podcast as it enables them to hear lectures repeatedly with 91 % of them agreeing. However a limited percentage of students felt that they would face technical difficulties while using audio podcast (14.9%) and didactic lectures alone will be sufficient without audio podcast (6.8%).

Table 1: Median scores of multiple-choice question test obtained by participants in intervention (group B, N=73) and control group (group A, N=75)

Groups	Sample size	Median(Inter-Quartile Range)	P value
A	75	6 (5-7)	0.576
B	73	6 (5-7)	

Table 2: Statements of the questionnaire pertaining to benefits of audio podcast and mean attitude score obtained by participants of both intervention (group B, N=73) and control (group A, N=75) groups.

Statements of the questionnaire	Mean attitude score
1. Listening audio podcast after the didactic lecture helped me to understand topic better	4.07
2. I believe that including audio podcast as a teaching aid along with didactic lectures will enhance my performance in the examinations	3.97
3. I find audio podcast useful because it will enable me to hear the lectures repeatedly which might help for my exams	4.07
4. Supplementing audio podcasts with didactic lectures is necessary to understand difficult topics in physiology	3.96
5. Podcasts are not a convenient form of learning as I might face some technical difficulties using them	3.57
6. I might not use audio podcasts because they are too time consuming	3.65
7. Hearing audio podcasts are not a good form of learning	3.76
8. Didactic lectures alone will be sufficient without audio podcast in the course curriculum	3.63
Overall mean score	3.83

Table 3: Number of students in both the groups(N=148) who responded to each statement in the questionnaire as mentioned in (Table 2) with Agree/strongly agree, Can't say or Disagree/strongly disagree respectively.

Serial number of statements in the questionnaire	Number of students who Agree/strongly agree	Number of students who Can't say	Number of students who Disagree/strongly disagree
1.	140(94.5%)	5(3.4%)	3(2.1%)
2.	131(88.5%)	16(10.8%)	1(0.7%)
3.	136(91.9%)	12(8.1%)	0(0%)
4.	132(89.2%)	12(8.1%)	4(2.7%)
5.	22(14.9%)	25(16.9%)	101(68.2%)
6.	11(7.4%)	36(24.4%)	101(68.2%)
7.	6(4.1%)	34(23%)	108(72.9%)
8.	10(6.8%)	44(29.7%)	94(63.5%)

DISCUSSION

Based on the performance of participants in the two groups, we are of the opinion that either podcast supplementation or studying from handout had similar influence. Participants who studied from handouts performed reasonably well for two reasons, students are

accustomed to study from a hardcopy and handout contained fundamental points of the didactic lecture. Participants belonging to podcast group performed well because of two reasons 1) participants were familiar with operating mobile phone, 2) participants were inquisitive and alert during podcast session. In addition, the didactic

lecture might have been equally efficient in grasping concepts. Findings of the present study is similar to another study which compared information recall among students belonging to video podcast group and live lecture group.⁶ However participants in the same study appreciated video podcasts for convenience. A study conducted among psychology undergraduate students observed, podcasts can only supplement didactic lectures and not replace it.¹⁴ An overall mean attitude score pertaining to perceived utility of podcast in this study was more than 3.0 suggesting that participants are in favor of audio podcasts. Researchers are increasingly using technology-based health interventions to promote acquisition of key skills and information.¹⁵ Two studies observed audiovisual podcast is specifically beneficial for revision purpose.^{12,16} Findings of the present study agrees with above mentioned studies. Students of practical biochemistry found that podcast was helpful for examination preparation.¹⁷ The principal advantages of podcast include ability to hear anytime and to hear at their own pace. Study conducted among undergraduate physiology students observed the preference for an aural learning style.¹⁸ This suggests audio podcasts are beneficial to subgroup of students in comparison to audiovisual podcasts.¹⁸ In addition audio podcast downloading time duration is less in comparison to video podcast. A group of students who routinely engage with podcasts achieve a statistically significant increase in grades.¹⁹ Students used podcasts to support their note taking for difficult concepts and unfamiliar vocabulary. In the present study more than 80% of participants agreed that podcasts are necessary to understand difficult topics in physiology. This demonstrates that revisiting is one of the advantages of podcasts and essential for understanding difficult concepts. In addition, ability to revisit podcast lecture many times may also decrease student's anxiety regarding missing subject content while taking notes.⁸ Majority of the students in the present study believed that including audio podcasts along with didactic lectures will enhance their performance in the examinations. Similar finding was observed in another study, where students used podcast especially during examination time and it helped them reading about the subject.²⁰ A study observed that majority of students found podcasting helpful for a better understanding of biochemistry.¹⁷ Greater proportion of students in the present study felt the utility of podcast in understanding physiology topics. A study observed lectures that are slide-based recital of facts would be boring when presented as video podcast session.²¹ This can be modified by using short podcasts of 5 to 10 minutes duration consisting of basic framework and concepts. In the present study we had used two audio clippings of

approximately 6 minutes each. On the other hand, the amount of information that can be provided in a short podcast is restricted and therefore information via conventional resources may be necessary.⁹ In the future, faculties of medical colleges might need training in preparation of podcasts to incorporate into their teaching.

LIMITATION OF THE STUDY

The study was conducted for two topics of physiology.

CONCLUSION

Performance of undergraduate participants undergoing podcast session was similar when compared to participants who studied from handouts. However participants have accepted various benefits of podcasts exclusively in understanding physiology topic better. Podcasts are useful as it facilitates participant to hear podcast repeatedly and to pause when required. Additional research on importance of audio podcast in the first-year subjects is crucial to empower benefits of audio podcasts as a teaching learning tool.

REFERENCES

1. Barrows HS. Problem-based, self-directed learning. *JAMA* 1983; 250(22):3077-3080. PMID: 6644989.
2. Punja D, Kalludi SN, Pai KM, Rao RK and Dhar M. Team-based learning as a teaching strategy for first-year medical students. *Australasian Medical Journal* 2014; 7(12):490-99. PMID: 25646125.
3. Mehtha NB, Hull AL, Young JB and Stoller JK. Just imagine: new paradigms for medical education. *Acad Med* 2013; 88:1418-23. PMID:23969368
4. Fridenberg M. Principles and pedagogy: the two P's of podcasting in the information technology classroom. *Information Systems Education Journal* 2008;6(6): 3-11. Available from: <https://pdfs.semanticscholar.org/0953/c93730467641f701f4154b01d0f42fd562a6.pdf>
5. Alikhan AA, Kaur RR and Feldman SR. Podcasting in dermatology education. *J Dermatolog Treat* 2010; 21(2):73-79. PMID: 19701846.
6. Schreiber BE, Fukuta J and Gordon F. Live lecture versus video podcast in undergraduate medical education: A randomized controlled trial. *BMC Med Educ* 2010; 10(68): 1-6. PMID: PMC2958969.
7. Kalludi SN, Punja D, Pai KM and Dhar M. Efficacy and perceived utility of podcasts as a supplementary teaching aid among first-year dental students. *Australasian Medical Journal* 2013; 6(9):450-57. PMID: PMC3794415.
8. Meade O, Bowskill and Lymn JS. Pharmacology as a foreign language: A preliminary evaluation of podcasting as a supplementary learning tool for non-medical prescribing students. *BMC Medical education* 2009; 9:74-86. PMID: PMC2804703.
9. Narula N, Ahmed L and Rudkowski J. An evaluation of the "5 Minute Medicine" video podcast series compared to conventional medical resources for the internal

- medicine clerkship. *Medical Teacher* 2012; 34(11):e751-55. PMID: 22646299.
10. Rainsbury J W and McDonnel. Podcasts: an educational revolution in the making? *J R Soc Med* 2016; 99(9):481-82. PMID: PMC1557886.
 11. Scutter S, Stupans I, Sawyer T and King S. How do students use podcasts to support learning? *Australasian Journal of Educational Technology* 2010;26(2): 182-91. Available from: <https://pdfs.semanticscholar.org/65e3/4e849eef8d701f31bd4256055207392a0b31>
 12. Shantikumar S. From lecture theater to portable media: students perceptions often enhanced podcast for revision. *Medical Teacher* 2009; 31(6):535-38. PMID: 18937140.
 13. Evans C. The effectiveness of m-learning in the form of podcast revision lectures in higher education. *Computer Education* 2008; 50(2): 491-98. Available from: <https://www.utmb.edu/pediedtech/pdfs/The%20effectiveness%20of%20m-learning%20in%20the%20form%20of%20podcast>
 14. Parson V, Reddy P, Wood J and Senior C. Education an iPod generation: undergraduate attitudes, experiences and understanding of vodcast and podcast use. *Learning, media and technology*.2009;34(3):215-28. Available from: <https://www.tandfonline.com/doi/abs/10.1080/17439880903141497>
 15. Aronson ID, Marsch LA and Acosta MC. Using findings in multimedia learning technology based health interventions to inform technology based behavioral health interventions. *Translation Behavior Medicine* 2003;3(3):234-243. PMID: PMC3771008.
 16. Meade O, Bowskill D and Lynn JS. Pharmacology podcasts: a qualitative study of non-medical prescribing students' use, perceptions and impact on learning. *BMC Med Educ* 2011; 11(2): 1-10. PMID: PMC3024307.
 17. Munch-Harrach D, Kothe C and Hampe W. Audio podcasts in practical courses in Biochemistry cost efficient e-learning in a well-proven format from radio broadcasting. *GMS Z Med Ausbild* 2013; 30(4):6-10. PMID: PMC3839072.
 18. Dobson JL. Learning style preferences and course performance in an undergraduate physiology class. *Adv Physiol Educ* 2009; 33(4):308-14. PMID: 19948680.
 19. Brooks C, Erickson G, Greer J and Gutwin C. Modelling and quantifying the behaviours of students in lecture capture environments. *Computer Education* 2014; 75:282-92. Available from: <http://hci.usask.ca/uploads/414-modelling.pdf>
 20. Walmsley AD, Perryer DG and Hill KB. Podcasts-an adjunct to the teaching of dentistry. *British Dental Journal* 2009; 206:157-60. Available from: <https://www.nature.com/articles/sj.bdj.2009.58>
 21. Hadjianastasis M and Nightingale K P. Podcasting in the STEM disciplines: the implications of supplementary lecture recording and 'lecture flipping'. *FEMS Microbiol Let* 2016; 363(4):1-4. PMID: 26764422.

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