

## Original Article

# The Effects of Video Podcast on Learning among Midwifery Students: A Randomized Controlled Trial

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### ABSTRACT

**Background:** Although some studies examined the challenges of using podcasts, there is limited information about the effects of video podcasting on learning outcomes. **Objectives:** The purpose of this study was to compare the effects of video podcasting and lecture on learning among midwifery students and to assess their satisfaction with podcasting. **Methods:** This was a randomized controlled crossover trial. Five-semester baccalaureate midwifery students of a class were randomized into two seventeen-person groups to receive education about gynecological diseases in two sessions. In the first session, students in Group A received educational materials through lecture, while their counterparts in Group B received the same materials through video podcasting. In the second session, held 1 week after the first session, students in Group A received educational materials through video podcasting, while their counterparts in Group B received the same materials through lecture. Students' learning and satisfaction were measured via multiple choice questions and a satisfaction questionnaire, respectively. The paired- and the independent-sample *t*-tests were used for within- and between-group comparisons, respectively. **Results:** Both lecture and video podcasting significantly increased the mean score of students' knowledge. However, between-group difference respecting the posttest mean score of knowledge was not statistically significant ( $15.3 \pm 2.3$  vs.  $14.5 \pm 2.7$ ;  $P = 0.35$ ). Students were satisfied with video podcasting though they believed that it cannot completely replace traditional lecture. **Conclusion:** Video podcasting has the same effects as lecture on learning outcomes among midwifery students. It can be used as a complement to lecture.

**KEYWORDS:** *Midwifery students, Podcast, Teaching methods*

## INTRODUCTION

Innovation in new teaching methods and improvements in the existing methods are among the most important goals of educational centers.<sup>[1]</sup> Lecture is the most commonly used teaching method. In this method, all learners are taught under the same conditions irrespective of their individual differences.<sup>[2]</sup> Despite the persistence of the lecture method, developments in technology have provided better opportunities for teaching.<sup>[3]</sup>

Podcasting is among the new technologies for learning promotion. It refers to video or audio files that can be downloaded from the internet and used via portable

media players.<sup>[4]</sup> Video podcasts contain educational materials for students<sup>[5]</sup> to manage and promote their learning.<sup>[6,7]</sup>

Podcasting offers better opportunities for learning. It improves learning flexibility, increases access to educational materials and learning opportunities, and enriches learning experiences.<sup>[8]</sup> Podcasting helps teachers create a dynamic learning environment through increasing students' interaction with educational

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materials and thereby enhancing their motivation for learning.<sup>[9]</sup> It also facilitates teacher–student interactions during the process of learning.<sup>[10]</sup>

Despite the popularity and the increasing use of podcasting in medical education,<sup>[11-13]</sup> particularly in undergraduate education,<sup>[14,12,13]</sup> there are limited data about its effectiveness. Students in some studies also considered it as effective as traditional teaching methods and only a complement not a substitute for live lectures.<sup>[15,16]</sup> Moreover, some studies reported technical problems in using podcasts, students' unfamiliarity with using them for learning,<sup>[17]</sup> and their lengthy and costly use.<sup>[18]</sup> Some studies also warned against using podcasts due to the lack of credible evidence regarding their effectiveness.<sup>[19,20]</sup> Due to the lack of evidence of the effectiveness of podcasting, further studies are yet needed to evaluate its effects on learning.

### Objectives

The purpose of this study was to compare the effects of video podcasting and lecture on learning among midwifery students and their satisfaction with podcasting.

## METHODS

### Design and participants

This randomized controlled crossover trial was conducted from December 2017 to January 2018. Study participants were 36 fifth-semester midwifery students of a single class in Guilan University of Medical Sciences, Rasht, Iran. Inclusion criteria were agreement for participation and lack of previous knowledge about the study subject matter (determined through a test). Exclusion criteria included more than one absence from educational sessions or failure to participate in either pre- or post-test of each session. Eligibility assessment and posttest data collection were performed by a research assistant who was unaware of the study groups.

Participants were recruited through convenience sampling, in which an invitation E-mail was sent to all 36 students, and those who accepted to participate in the study were recruited. Two students were not willing to participate and hence were excluded. These two students received educational materials through the lecture and PowerPoint presentation methods. The remaining 34 students were randomly assigned to Groups A (even numbers) and B (odd numbers) based on their student number. Each group contained seventeen participants [Figure 1].

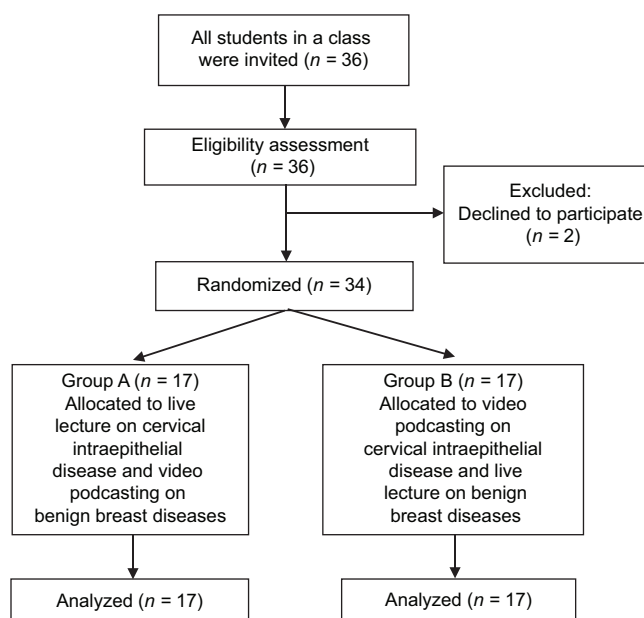


Figure 1: The flow of participants in the study

### Intervention

Participants were provided with educational materials regarding gynecological disorders, namely intraepithelial cervical diseases in the first session and benign breast diseases in the second session. In the first session, participants in Group A received educational materials about intraepithelial cervical diseases through traditional lecture and PowerPoint presentation, while those in Group B received educational materials from the same instructor via video podcasting. In the second session, held 1 week after the first session, students in Group A received educational materials about benign breast diseases through video podcasting, while their counterparts in Group B received the same materials via the lecture method. Educational materials for both groups were the same in duration (about 75 min) and content and were developed using the most recent midwifery textbook, articles, and images. The instructor in both groups was a senior faculty member of Guilan University of Medical Sciences, Rasht, Iran, with a history of teaching gynecology courses. She was not a member of the research team.

In the lecture method, the instructor provided educational materials in face-to-face sessions using PowerPoint slides. In the video podcast method, the same slides and lectures were used to create video podcasts which were individually used by students. To create video podcasts, PowerPoint slides and the lectures were imported into the Articulate Storyline software (v. 2.1212.1412), and the output was taken to the Sharable Object Content Reference Model (SCORM™). Video podcasts were available online for download on the website of Rasht

faculty of nursing and midwifery. All students had free access to the related podcasts and could use them on personal computers in the computer room of the faculty using earphones and Windows Media Player. They could pause and rewind podcasts during the class.

### Instruments

In each session, participants in both groups answered questionnaires with multiple choice questions both before and after the provision of educational materials. Questionnaires included questions on intraepithelial cervical diseases (twenty questions) and benign breast diseases (twenty questions). Pretests were performed immediately before giving the lectures or providing the podcasts. The validity of the questionnaires was assessed by several experts in medical education. Test–retest stability assessment on the data collected from twenty students also revealed a Kuder–Richardson coefficient of 0.75. Participants also completed a satisfaction questionnaire with fourteen items on satisfaction with podcasting responded on a five-point Likert-type scale. The average time for completing each questionnaire was 15 min. Participants' demographic characteristics (age and study duration in university) were also assessed at the beginning of the study.

### Ethical considerations

The Ethics Committee of Guilan University of Medical Sciences, Rasht, Iran, approved this study (code: IR.Guilan.REC.1394.48). All the students were informed about the study aims, the voluntary nature of their participation, and the confidentiality of their personal data. Informed consent was obtained from all participants and the study registered in Iranian Registry of Clinical Trials (IRCT20190804044437N1).

### Data analysis

Data analysis was done via the SPSS software (v. 16.0) at a significance level of  $<0.05$ . The data were double-checked for errors in data entry. The normality of the data was tested through the Kolmogorov–Smirnov test. As the main variables showed normal distribution, the paired-sample *t*-test was used to compare pre- and post-test scores in each group, and the independent-sample *t*-test was used to compare groups respecting pre- and post-test scores.

### RESULTS

On average, participants aged  $20.7 \pm 1.30$  years (in the range of 19–25). All students were Iranian and had passed two academic years at university. No statistically significant differences were found between the two groups regarding participants' demographic characteristics.

The results of the paired-sample *t*-test showed that after each session, the posttest mean scores of students' knowledge in both groups were significantly greater than their corresponding pretest values [Table 1]. Furthermore, after the first session, between-group comparisons via the independent-sample *t*-test revealed no significant difference between the lecture and the podcast methods regarding the posttest mean score of knowledge ( $15.3 \pm 2.3$  vs.  $14.5 \pm 2.7$ ;  $P = 0.35$ ). However, after the second session, students' knowledge in podcast group was significantly greater than the lecture group [ $15.0 \pm 2.6$  vs.  $12.8 \pm 2.7$ ;  $P < 0.0001$ ; Table 1].

Most participants were satisfied with video podcasting [Table 2]. Accordingly, 85% of them believed that video podcasting promotes their concentration on learning, 100% of them agreed that the pause and the rewind options of video podcasting were attractive, and 97.1% of them believed that video podcasting was useful for reviewing lessons before exams. Moreover, 73.5% of the students noted that video podcasting cannot completely replace traditional lecture, and 91.2% of them considered that along with lecture, video podcasting can be a complementary method for teaching.

### DISCUSSION

Results illustrated that both video podcasting and lecture had significant effects on learning. Although there was no significant difference observed between the two groups regarding the effects of these two methods, at the second session, students' knowledge in podcast group was significantly greater than the lecture group. It seems that despite the flexible learning opportunities provided by podcasting, at the first using of the podcast, the students were novice in using it and could not benefit it suitably. The better results of the podcast method at the second session might be attributed to the inevitable contacts of the students in the two groups and some information

**Table 1: Within-group comparisons respecting the mean score of students' knowledge<sup>a</sup>**

| Teaching methods      | Lecture        | Podcast        | <i>P</i> <sup>c</sup> |
|-----------------------|----------------|----------------|-----------------------|
| Students (groups)     | A              | B              |                       |
| Pretest               | $6.4 \pm 2.4$  | $6.6 \pm 1.69$ | 0.78                  |
| Posttest              | $15.3 \pm 2.3$ | $14.5 \pm 2.7$ | 0.35                  |
| <i>P</i> <sup>b</sup> | $<0.0001$      | $<0.0001$      |                       |
| <b>After a week</b>   |                |                |                       |
| Students (groups)     | B              | A              |                       |
| Pretest               | $7.4 \pm 1.62$ | $6.6 \pm 2.3$  | 0.24                  |
| Posttest              | $12.8 \pm 2.7$ | $15 \pm 2.6$   | $<0.0001$             |
| <i>P</i> <sup>b</sup> | $<0.0001$      | $<0.0001$      |                       |

<sup>a</sup>Data presented as mean $\pm$ SD: Standard deviation, <sup>b</sup>Paired-sample *t*-test, <sup>c</sup>Independent samples *t*-test

**Table 2: Student satisfaction with video podcasting<sup>a</sup>**

| Number | Satisfaction items  | Level of agreement |           |          |                   |            |
|--------|---|--------------------|-----------|----------|-------------------|------------|
|        |   | Strongly agree     | Agree     | Disagree | Strongly disagree | No opinion |
| 1      | Video podcasting is associated with greater concentration on learning                           | 17 (50)            | 12 (35.3) | 3 (8.8)  | 2 (5.9)           | 0          |
| 2      | Video podcasting can completely replace the conventional class attendance method                | 2 (5.9)            | 7 (20.6)  | 7 (20.6) | 18 (52.9)         | 0          |
| 3      | The pause option is one of the most attractive points of video podcasting                       | 24 (70.6)          | 10 (29.4) | 0        | 0                 | 0          |
| 4      | The rewind option is one of the most attractive points of video podcasting                      | 27 (79.4)          | 10 (29.4) | 0        | 0                 | 0          |
| 5      | Video podcasting is easy to use   | 19 (55.9)          | 15 (44.1) | 0        | 0                 | 0          |
| 6      | Lack of interaction with the instructor can be one of the weaknesses of video podcasting        | 15 (44.1)          | 16 (47.1) | 2 (5.9)  | 1 (2.9)           | 0          |
| 7      | Podcasting is a useful method for reviewing lessons before exams                                | 24 (70.6)          | 9 (26.5)  | 1 (2.9)  | 0                 | 0          |
| 8      | Video podcasting is more attractive than the conventional class attendance method               | 8 (23.5)           | 16 (47.1) | 7 (20.6) | 3 (8.8)           | 0          |
| 9      | Video podcasting is associated with greater peace of mind for those who are slow at note taking | 23 (67.6)          | 10 (29.4) | 1 (2.9)  | 0                 | 0          |
| 10     | Video podcasting can complement the lecture method  | 19 (55.9)          | 12 (35.3) | 2 (5.9)  | 1 (2.9)           | 0          |
| 11     | Impossibility of discussion is among the weaknesses of video podcasting                         | 20 (58.8)          | 11 (32.4) | 2 (5.9)  | 1 (2.9)           | 0          |
| 12     | Video podcasting is associated with higher number of absences from class                        | 15 (4.4)           | 11 (32.4) | 7 (20.6) | 1 (2.9)           | 0          |
| 13     | Video podcasting prevents the development of accountability among students                      | 8 (23.5)           | 12 (35.3) | 7 (20.6) | 4 (11.8)          | 3 (8.8)    |
| 14     | Video podcasting prevents the development of self-discipline skills among students              | 9 (26.5)           | 8 (23.5)  | 8 (23.5) | 8 (23.5)          | 1 (2.9)    |

<sup>a</sup>Data presented as *n* (%)

exchange about the podcast method. Two earlier studies also reported no significant difference between the effects of lecture and video podcasting among medical students<sup>[14]</sup> and nursing students.<sup>[15]</sup> Another study on midwifery students in Iran found web-based teaching as effective as lecture in improving students' knowledge.<sup>[16]</sup> Contrarily, three studies showed that video podcasting was significantly more effective than lecture in improving learning outcomes.<sup>[8,21,22]</sup> The conflict between the studies might be attributable to different factors such as the students' ability to work with podcasts, the length of the studies, and even to the lecturers' presentation skills.

Assessment of students' opinions in the present study also highlighted that they were satisfied with video podcasting and considered it as an attractive teaching method due to its easy applicability, accessibility, and flexibility. Several earlier studies also reported the same findings.<sup>[6,23,24]</sup> A review study also reported the acceptability of video podcasting among medical students due to their greater control over their learning through video podcasting.<sup>[25]</sup> However, a study found that students had lower satisfaction with video podcasting compared with lecture.<sup>[14]</sup> Students in another study also preferred traditional teaching over web-based teaching. That study attributed such preference to factors such as students' personal learning styles, previous experiences, and unfamiliarity with new teaching technologies.<sup>[17]</sup>

Our participants considered video podcasting as a complement to lecture rather than a substitute for it. Previous studies also reported the same finding.<sup>[14,26]</sup> Moreover, our participants noted that inability to interact with instructor was a weakness of video podcasting. Similarly, a former study reported that students disliked podcasting in learning because it did not allow them to ask their questions from their instructors.<sup>[27]</sup> A recent study has also concluded that in lecture, as a face-to-face education method, teacher–learner interaction is stronger and learners have the opportunity to ask their questions and broaden their understanding of the provided educational materials<sup>[28]</sup> which consequently satisfied them of the lecture method. Moreover, our findings showed that students used video podcasts to review lessons. This is in line with the findings of a former study which reported that students used podcasts to get ready for examinations.<sup>[4]</sup>

Although podcasts are widely used in medical education, only a few studies have assessed its effects among medical students in Iran. A former study also reported the lack of firm evidence regarding the effectiveness of video podcasting.<sup>[19]</sup> Such lack of evidence makes it difficult to set benchmarks for change.

The randomized controlled crossover design of the present study allowed us to make sure that the groups received the same content. Moreover, we attempted to enhance the rigor of the study through assessing student satisfaction with video podcasting. Yet, the

study had some limitations. For instance, the length of the intervention and the number of educational sessions for using each method were short, and the students in the two groups were perhaps in contact and disseminated some information about the teaching methods they have experienced. Therefore, replicating the study with more sessions of each teaching methods and preventing the contact between the groups is suggested. Moreover, students' opinions about podcasts were assessed using quantitative methods while qualitative methods could provide more in-depth information. More rigorous studies can provide firmer evidence regarding the effects of video podcasting on learning outcomes.

## CONCLUSION

This study shows that video podcasting has the same effects as traditional lecture on learning among midwifery students. Yet, video podcasting provides students with easier access to educational materials, helps them have greater control over their learning, and gives them the opportunity to review educational materials for several times. Thus, video podcasting can be considered as a complement to traditional teaching methods. Further studies are needed to produce firmer evidence regarding the effects of video podcasting on learning outcomes.

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## Conflicts of interest

There are no conflicts of interest.

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