A Rapid Review Of Guidelines Of Instructional Operative Video

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ABSTRACT

Teaching skills are far more complex than teaching content. It needs framework, observation, and feedback. One of the popular media for learning operative procedures is video. However, the guidelines for instructional videos for surgical postgraduate students have not been established. This article tried to serve the rapid review of essential design principles to evaluate the quality of demonstration videos of procedural skills and also use the design principles in one video example. *Methods*. The rapid review was conducted according to Crawford's framework. Scopus was chosen as a single database. The inclusion criteria are full texts that discuss instructional videos and postgraduate medical learning skills. There were no language restrictions. Three articles were chosen from six that resulted from the literature search. The three articles are appraised based on the case-controlled or cross-sectional methodology by The Joanna Briggs Institute Critical Appraisal tools for use in JBI Systematic Reviews. *Results*. A total of six articles were retrieved, and the full text was reviewed for three pieces that met the study's criteria. Those articles were heterogenous in the design principles of instructional video. Two articles agreed on these points: short videos and step-by-step procedures with audio narratives. Another paper by Simon discussed several details aspects of the video, such as pathology, who are the operators in the video. *Conclusions*. Videos are a valuable educational tool for procedural skill knowledge acquisition and retention. Several important points should be embedded in the video, such as the step-by-step procedure and the short duration of the video. Future research needs to be carried out on establishing the guidelines of instructional videos to enhance the mastering of procedural skills.

Keywords: Design, principles, procedures, surgery, video.

ABSTRAK

Latar belakang. Keterampilan mengajar jauh lebih kompleks daripada mengajar konten dari pembelajaran. Mengajarkan keterampilan mengajar memerlukan kerangka kerja, pengamatan, dan umpan balik. Salah satu media pembelajaran prosedur operatif yang populer adalah video. Namun, pedoman video instruksional untuk mahasiswa pascasarjana bedah (residen bedah) belum ditetapkan. Artikel ini mencoba menyajikan tinjauan cepat prinsip-prinsip desain esensial untuk mengevaluasi kualitas video demonstrasi keterampilan prosedural dan juga menggunakan prinsip-prinsip desain dalam satu contoh video yang dipublikasikan online. Metode. Tinjauan cepat dilakukan menurut kerangka kerja Crawford. Scopus dipilih sebagai database tunggal. Kriteria inklusi adalah teks lengkap yang membahas video instruksional dan keterampilan belajar kedokteran pascasarjana. Tidak ada batasan bahasa yang dipakai dalam artikel.. Tiga artikel dipilih dari enam artikel yang dihasilkan dari pencarian literatur. Ketiga artikel dinilai berdasarkan metodologi kasus-kontrol atau cross-sectional oleh alat Penilaian Kritis Institut Joanna Briggs untuk digunakan dalam Tinjauan Sistematis JBI. Hasil. Sebanyak enam artikel diambil, dan teks lengkap ditinjau untuk tiga bagian yang memenuhi kriteria penelitian. Artikel-artikel tersebut heterogen dalam prinsip desain video instruksional. Dua artikel menyepakati poin-poin ini: video pendek dan prosedur langkah demi langkah dengan narasi audio. Makalah lain oleh Simon membahas beberapa aspek detail dari video tersebut, seperti patologi, siapa operator dalam video tersebut. Kesimpulan. Video adalah alat pendidikan yang berharga untuk akuisisi dan retensi pengetahuan keterampilan prosedural. Beberapa poin penting harus ditekankan dalam video, seperti prosedur yang terdapat dalam video Nampak langkah demi langkah dan durasi video yang singkat. Penelitian selanjutnya perlu dilakukan untuk menetapkan pedoman video pembelajaran untuk meningkatkan penguasaan keterampilan prosedural.

Kata kunci. Desain, prinsip, prosedur, pembedahan, video.

1. Introduction

Training in clinical procedures ("procedural skills") is integral to medical programs, especially residency programs. Mastering procedural skills is an essential part of the achievement of EPA (entrustable professional activities). Once a satisfactory level of performance has been reached, supervisors can authorize a resident to carry out a task without direct supervision using an EPA system (1). In the last decade, there were considerable changes in postgraduate surgical programs, such as pandemic events that reduced the operations experience, the introduction of new therapies, the widespread implementation of electronic medical records, and the need to reduce work hours to increase the residents' well-being and patient safety. As a consequence, the residents experience a decline in the number of operations and autonomy in the operating room(1). Video-based education is an alternative and efficient educational pathway to overcome those problems(2).

Video based education is defined as the delivery of educational material through the dual use of auditory and visual processing pathways via video technology(1). VBE has a higher likehood of recall, because the information presented in both pathways according to the result of a study in dual-coding learning theory(3). Based on Peyton theory, students need to repeat the steps several times to master the skill and retain the skill (4), and VBE would be a most easily accessed resource when the residents preparing for the operation. This is proved in a survey to the general surgery resident that concluded video was the most popular sources that the resident used before they prepare for the operation(1).

On the other hand, a paper showed the different effect of video in learning. Video increased the cognitive load for learners with a lesser preference for visual materials, but video decreased the cognitive load for students with a greater preference for visual materials (5). Regarding the source of the video, many papers also mentioned youtube as the most popular platform to view procedural skills. However, the educational quality and validity of the videos are variable (2).

Due to the concern of the pedagogic aspects and validity of procedural video and to the author's knowledge, the guidelines for instructional videos for surgical postgraduate students have not been established. This article tried to serve the rapid review of essential design principles to evaluate the quality of demonstration videos of procedural skills and also to apply the design principles in one video example. Research Question: What are important *design principles* that can be used to evaluate the quality of demonstration videos of procedural skills?

2. Methods.

A rapid review based on Crawford was followed (6). Scopus was chosen as a single database because many thousand articles are cited in Scopus. Due to time and budget constraints, no team was involved in this process and the articles' selection. The duration of the process was from January to March 2023.

	Population	Intervention	Control	Outcome
Free text term	Postgraduate medical learner OR postgraduate medical education OR medical education continuing OR resident	Online video* OR video recording OR Instructional video*		Medical* Surgeons OR "surg* procedures" OR operative
Scopus Term	(TITLE-ABS-KEY (postgraduate AND medical AND learner OR postgraduate AND medical AND education OR medical AND education AND continuing OR resident))	TITLE-ABS-KEY (online AND video* OR instructional AND video*))		(TITLE-ABS-KEY (medical* AND surgeons OR "surg* procedures" OR operative))

TITLE-ABS

KEY (postgraduate AND medical AND learner OR postgraduate AND medical AND education OR medical AND education AND continuing OR resident)
Show less
8,214 results
TITLE-ABS-KEY (online AND video* OR instructional AND video*)
37,517 results
TITLE-ABS-KEY (medical* AND surgeons OR "surg* procedures" OR operative)
206,741 results

The resulting articles are six articles. The titles were screened for duplicated and reviewed based on three inclusion criteria: (1) Video, (2) postgraduate learner/resident in a medical or field (3) operative skills. A postgraduate learner/resident is a person who undertakes continuous training in a medical field after completing basic training. After the screening, six articles resulted in three articles (Table 1).

Quality appraisal of studies

The three articles are appraised based on the case-controlled or cross-sectional methodology by The Joanna Briggs Institute Critical Appraisal tools for use in JBI Systematic Reviews. The results are depicted in Appendix 1.

3. Results

Another survey of the junior and senior residents to determine desired content and format of an operative video-based education module showed that the residents preferred the details of each operation step in the video, the indication mentioned in the video. Another critical point is that they preferred the video that was peer-reviewed and featured an attending surgeon they knew(1).

Tabel 1 Summary of Design Principles from the Screened Literature

	Sell et al paper	Simon et al	Bogomolova et al	Summary of Design Principles
Important design principles	- accuracy of the video - video being peer-reviewed - the video graphics quality -the video is free to view - the video features an attending surgeon I know -details of each step of the operation (how to avoid mistakes) - adequate explanation of the critical portion of the case - ideal length of video 5-10 minutes	- procedure and pathology in the title - identification of the anatomy -narration and/or caption - patient consent - main operator name and institution - relevant patient history	- Step-by-step approach - accompanied by auditory narration -Duration of video 4 minutes - 3-D instructional videos	1. Step-by-step approach 2. Accompanied by narration 3. There should be information about the surgeon's name, explanation of the case, procedure, identification of the anatomy, trick of the operation 4. The video graphics quality and 3-D videos

Several key features should be mandatory for educational surgical videos, such as written procedure and pathology in the title, identification of anatomy, narration and caption, patient consent, primary operator name and institution, and relevant patient history(Simon et al., 2021).

Other essential points that should be embedded in the video are an adequate explanation of the critical portion of the case, proper incision and/or port placement, tips for the operation, and how to avoid common mistakes for this type of operation (1). Sell et al. also discussed the ideal length of the VBE module 5-10 m (1). The ideal time was also discussed in another randomized controlled trial that compared 3D and 2 D video in low and high visual space acquity was 4 minutes. Another critical design principle from this study was a step-by-step demonstration of the procedure on a simulation model accompanied by auditory narration (7).

4. Discussion

Comparing with a video example (https://medtube.net/neurosurgery/medical-videos/32143-lumbar-microdiscectomy)

This video presented a lumbar microdiscectomy uploaded two months ago, and 3466 views have seen it. It started with the disclaimer that 90 percent of herniated nucleated discs healed spontaneously without operative treatment. The video showed the name of the surgeon, department, and hospital. A sagittal MRI-T2 scan of the lumbar region clearly showed the pathology: Herniated nucleated disc L5-S1. Because the procedure of micro-discectomy did not present in a step-by-step approach, mastering the skills of this operation was hard, especially for the junior resident. There was no narration in the video, and it was only combined with the music sound as the background. Identification of anatomy was presented in a concise segment, namely a scene with three pictures inside, such as (1) the anatomy of the location of the operation, (2) the schematic view of the operative procedure (3) the schematic view of the pathology. This video did not follow many instructional guidelines from the literature, such as no clear (with arrow-point) identification of anatomy, narration and caption, patient consent, and relevant patient history. The duration of the video was quite long, almost 15 minutes. Video-based education is an effective tool for teaching and mastering skill Video-based education video plays a significant role in surgical postgraduate training programs (1,2). Regarding cognitive load theory, the capacity of human working memory involved in processing information is limited. When the total of three types of load exceeds working memory capacity, a cognitive overload occurs which impairs learning(8). Design principles in the procedural video should be segmented into small units in short periode of time. Breaking information flow into small units reduces the cognitive oveload from the passage of the information. The students have the benefit of having temporary pauses between the steps to provide students with the time needed to cognitively process the information, increase recall, and master the skills.

5. Conclusion

Videos are a valuable educational tool for procedural skill knowledge acquisition and retention. Future research need to be carried out on establishing the guidelines of instructional video to enhance the mastering of procedural skills. Several important points should be embedded in the video, such as step-by-step procedures and short video duration.

6. Acknowledgment

The author highly appreciate the support of Dr Taufiq Fredriek Pasiak, dean of the medical school of UPN Veteran Jakarta and MHPE Maastricht University.

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