JOTE Journal of Occupational Therapy Education

Volume 5
Issue 2 *Online and Simulation Learning in Occupational Therapy Education*

Article 2

2021

Considerations in the Use of Podcasts for Teaching and Learning in Occupational Therapy: A Scoping Study

Sarah Briand
Université de Sherbrooke

Ingrid Malo-Leclerc
Université de Sherbrooke

Michaël Beaudoin

Étienne Croisetière
Université de Sherbrooke

Alexandre Tremblay
Université de Sherbrooke

See next page for additional authors

Recommended Citation

Briand, S., Malo-Leclerc, I., Beaudoin, M., Croisetière, É., Tremblay, A., Côté-Boulanger, M., & Carrier, A. (2021). Considerations in the Use of Podcasts for Teaching and Learning in Occupational Therapy: A Scoping Study. *Journal of Occupational Therapy Education, 5* (2). https://doi.org/10.26681/jote.2021.050202

Considerations in the Use of Podcasts for Teaching and Learning in Occupational Therapy: A Scoping Study

Abstract

Evidence-based practice integrates and supports the best interventions in clinical practice. However, a gap of about ten years may elapse between the production of evidence and integration of best practices in clinical settings. Some technologies, such as podcasting, have become increasingly popular and are emerging as an innovative teaching modality that can support knowledge acquisition and integration. This scoping study gathered and synthesized the information in the literature regarding the use of podcasts by occupational therapy clinicians and students as a means for teaching and learning evidence-based knowledge. A scoping study approach was used following the five stages defined by Arksey and O'Malley. In four databases and using 40 keywords, two team members selected and cross-checked articles. Two team members also extracted data and analyzed them in the form of descriptive statistics and salience (recurrence and importance). Of the 46 articles selected, seven broad categories of 20 important themes related to the use of podcasting were identified: facilitators and obstacles to podcast use, advantages and disadvantages of podcasts, effects of podcasts, potential utility of podcasts, and elements to consider for podcast creation. Podcasting is an innovative and appropriate modality for the retention of knowledge and the optimization of practical skills. It differs from traditional methods in its ease of access and portability. Many positive effects have been associated with its use. However, podcasts should not replace class attendance or other active learning opportunities.

Keywords

Education, evidence-based practice, knowledge acquisition, podcast

Acknowledgements

We want to thank Ms Annick Bourget, OT, for coming up with the original idea of this research, and extend our gratitude to the Faculty of medicine and health sciences of Université de Sherbrooke for the constant support including financial. We also want to thank Ms Louise Tremblay, OT and research assistant, for her help in preparing the manuscript for submission.

Authors

Sarah Briand, Ingrid Malo-Leclerc, Michaël Beaudoin, Étienne Croisetière, Alexandre Tremblay, Mariane Côté-Boulanger, and Annie Carrier

JOTE
Journal of Occupational Therapy Education

Volume 5, Issue 2

Considerations in the Use of Podcasts for Teaching and Learning in Occupational Therapy: A Scoping Study

Sarah Briand, OT[1], Ingrid Malo-Leclerc, OT[1], Mariane Côté-Boulanger, OT[1],

Étienne Croisetière, OT[1], Alexandre Tremblay, OT[1],

Michaël Beaudoin ,MAdm, OT[2], and Annie Carrier, PhD, MSc, LLM, BA(psy), OT[1,3]

Université de Sherbrooke[1]

OT Research Centre on Aging, University Integrated Health and Social Services Centre of the Eastern Townships – Sherbrooke University Hospital, CIUSSS de l'Estrie–CHUS[2]

Research Centre on Aging, CIUSSS de l'Estrie–CHUS[3]

Canada

ABSTRACT

Evidence-based practice integrates and supports the best interventions in clinical practice. However, a gap of about ten years may elapse between the production of evidence and integration of best practices in clinical settings. Some technologies, such as podcasting, have become increasingly popular and are emerging as an innovative teaching modality that can support knowledge acquisition and integration. This scoping study gathered and synthesized the information in the literature regarding the use of podcasts by occupational therapy clinicians and students as a means for teaching and learning evidence-based knowledge. A scoping study approach was used following the five stages defined by Arksey and O'Malley. In four databases and using 40 keywords, two team members selected and cross-checked articles. Two team members also extracted data and analyzed them in the form of descriptive statistics and salience (recurrence and importance). Of the 46 articles selected, seven broad categories of 20 important themes related to the use of podcasting were identified: facilitators and obstacles to podcast use, advantages and disadvantages of podcasts, effects of podcasts, potential utility of podcasts, and elements to consider for podcast creation. Podcasting is an innovative and appropriate modality for the retention of knowledge and the optimization of practical skills. It differs from traditional methods in its ease of access and portability. Many positive effects have been associated with its use. However, podcasts should not replace class attendance or other active learning opportunities.

Introduction

Evidence-based practice, defined as the integration of the best research evidence with clinical experience and client values (Bozzolan et al., 2014), is a well-known concept in healthcare (Thomas & Law, 2013). However, a gap still exists between the production of evidence-based data and its integration into clinical practice (Morris et al., 2011), despite clear advantages associated with evidence-based practices. Indeed, evidence may provide clinicians with answers when faced with dilemmas regarding intervention quality (Horsley et al., 2011) and guide clinical decision-making in order to achieve the optimal patient outcome (Boruff & Thomas, 2011). Evidence-based practices rely on access to and integration of evidence-based knowledge.

For both occupational therapy students and clinicians, evidence-based knowledge is difficult to access (Upton et al., 2014), integrate, and apply (Coomarasamy et al., 2003). The use of technology could facilitate its access (Erardi & Hartmann, 2008), integration, and application (Eonta et al., 2011; Salloum & Smyth, 2013). Due to its accessibility, versatility, and low cost, podcasting is already being used for learning purposes (Kazlauskas & Robinson, 2012; Lee et al., 2008; Salloum & Smyth, 2013) and could facilitate knowledge integration in practice (Kazlauskas & Robinson, 2012). Podcasts are defined as "audio broadcast files that are available online for listening via a number of technological devices" (Hargett, 2018, p. 55). In academic and continuing education contexts, listening to podcasts is considered an effective learning tool (Meade et al., 2011; Salloum & Smyth, 2013), but podcasts are also effective when generated by the learner (McLoughlin et al., 2006). In fact, the process of podcast creation has been shown to promote the ability to express and conceptualize covered topics, active participation in learning, and the generalization of acquired knowledge (Powell & Robson, 2014). The creation of podcasts can even stimulate metacognition in students when accompanied by guided group discussions (McLoughlin et al., 2006). In these discussions, students can reflect on the podcasting activity process, display self-regulated learning and develop regulatory strategies and increased knowledge of task demands (McLoughlin et al., 2006).

In order to use podcasts optimally in learning contexts, whether continuing or entry-level education, well-defined operating learning and teaching modalities are essential. However, despite their association with optimized learning and functions in practicality and versatility, no integrated picture encompasses how to use podcasts to facilitate knowledge acquisition, as far as we know. Therefore, the overall goal of this study was to gather and synthesize information in the literature regarding learning and teaching by means of podcasting. Such a portrait could guide optimal pedagogical use of podcasting among occupational therapy clinicians and students and, in doing so, could impact education and clinical services in occupational therapy by providing a means to facilitate the knowledge sharing between the research and clinical communities.

DOI: 10.26681/jote.2021.050202

Method

To achieve the research goal, a scoping study approach was implemented. Scoping studies allow for existing research in a specific field – in this case, podcasting as a tool for teaching and learning – to be collected, synthesized and made available (Arksey & O'Malley, 2005). The five stages defined by Arksey and O'Malley were followed.

Identifying the Research Question (Stage 1)

Initially, the general question of the study was centered around occupational therapy students and clinicians, specifically. However, through the process of article selection, the team realized that very few relevant articles were published in the field of occupational therapy. Therefore, the studied population was broadened, and the final research question was determined to be: What do we know about podcast use and creation as a teaching and learning tool among students and clinicians in their initial and continuing education?

Identifying and Selecting Articles (Stages 2 and 3)

Using the PICO (patient/population, intervention, comparison, and outcomes**)** method (Center of Evidence-Based Medicine, n.d.), the team selected keywords, and a university librarian validated them. In order to focus more specifically on articles related to each type of learner (students and clinicians), question 1 was subdivided. To optimize the search, the following keywords were used: *podcast*, ipodcast*, blogcast*, vodcast*, mobile broadcast*, medical student*, medical student*, medical education, health education, health student*, high* education, undergraduate, continuous* education, creation*, create*, design*, production*, design*, produc*, develop*.* As the research questions fell into two broad disciplines (health and education), the team used the following databases: CINHAL, Medline, ERIC, and Education Source. Because of time constraints, we did not expand our search to include the reference lists of identified articles (over 400 articles - see Figure 1).

In order to ensure that the articles selected were current and relevant to our societal and educational context, inclusion criteria were imposed: articles were retained if they comprised of research studies or grey literature and were published in Western countries between January 2007 and March 2018. As mentioned, since over 400 articles were identified with the application of the inclusion criteria, we did not expand our search of grey literature outside of traditional peer-reviewed databases. Other inclusion criteria consisted of the languages in which the articles were published; selected articles had to be written in English or French to ensure reading comprehension by the authors. Finally, articles that did not address qualities of podcasting, its role in evidence-based learning in healthcare or the process of creating podcasts as a learning tool were excluded.

The latter criteria were addressed as two team members made an initial independent selection based on the title and abstract and then, through consensus, a final selection. Afterward, a member of the team read each selected article and decided whether it was retained or not while a second member validated their choices. The team members settled disagreements through scholarly discussions until a consensus was reached.

Charting Data and Disseminating Results (Stages 4 and 5)

Data (quantitative and qualitative) from the selected studies were extracted and classified using Excel tables. These tables were semi-open, giving way for the emergence of new categories. Just as for article selection, two members proceeded with the extraction, and consensus resolved the differences. Specifically, two members retrieved data from 10.0% of items, and if there was disagreement, a discussion led to consensus. This procedure was repeated until both members obtained the same results.

Quantitative data were analyzed through descriptive statistics. Qualitative data were first coded. Specifically, team members re-read the extracted qualitative data and identified codes (labels) for each meaningful piece of information extracted (Buetow, 2010). For example, the sentences “new technology may not be compatible with all devices. (…) a video in MP4 format may play on the computer but not on certain portable players and cell phones” were labeled “Technological incompatibility.” To ensure consistency, each code was defined in a lexicon. For example, “Technological incompatibility” was defined as “a discrepancy between the podcast format and the learner's player that makes it difficult to download or watch/listen to the podcast.” Then, according to external and internal homogeneity (Patton, 1990), codes were classified into major themes. For example, “Technological incompatibility” was combined with “Technological dysfunction” to become “Technological dysfunction or incompatibility” and defined as “Any ‘glitch’ or problem on a device or platform that makes it difficult for the user to download or watch/listen the podcast.” Finally, each theme was analyzed through saliency analysis (Buetow, 2010), a process through which the recurrence and importance of the data is assessed in order to identify and make visible the aspects that stand out from that said data. Once the importance and recurrence of each theme was determined, and they were assigned to one of the following four divisions (Buetow, 2010): Highly important and recurrent; Highly important but not recurrent; Not highly important but recurrent; Not highly important and not recurrent.

The team determined importance by consensus based on whether or not the theme had the potential to concretely optimize the use and design of podcasting in initial and continuing education in health-related fields. In order to determine recurrence, qualitative data were subjected to a quantitizing process (Nzabonimpa, 2018) and then subjected to statistical analysis. A theme was considered recurrent if the number of articles referring to it was equal or higher than the average quantity of references for each theme, namely five. For example, the theme “Technological dysfunction or incompatibility” with three articles was classified as not recurrent. Descriptive statistics were also made to identify specific recurrences for each of the themes categorized as important.

As for any scoping study, the analysis was not intended to assess the quality of evidence found (Arksey & O’Malley, 2005). The results were summarized in tables and written texts presenting the important themes. Highlights of the analysis are put forth to

DOI: 10.26681/jote.2021.050202

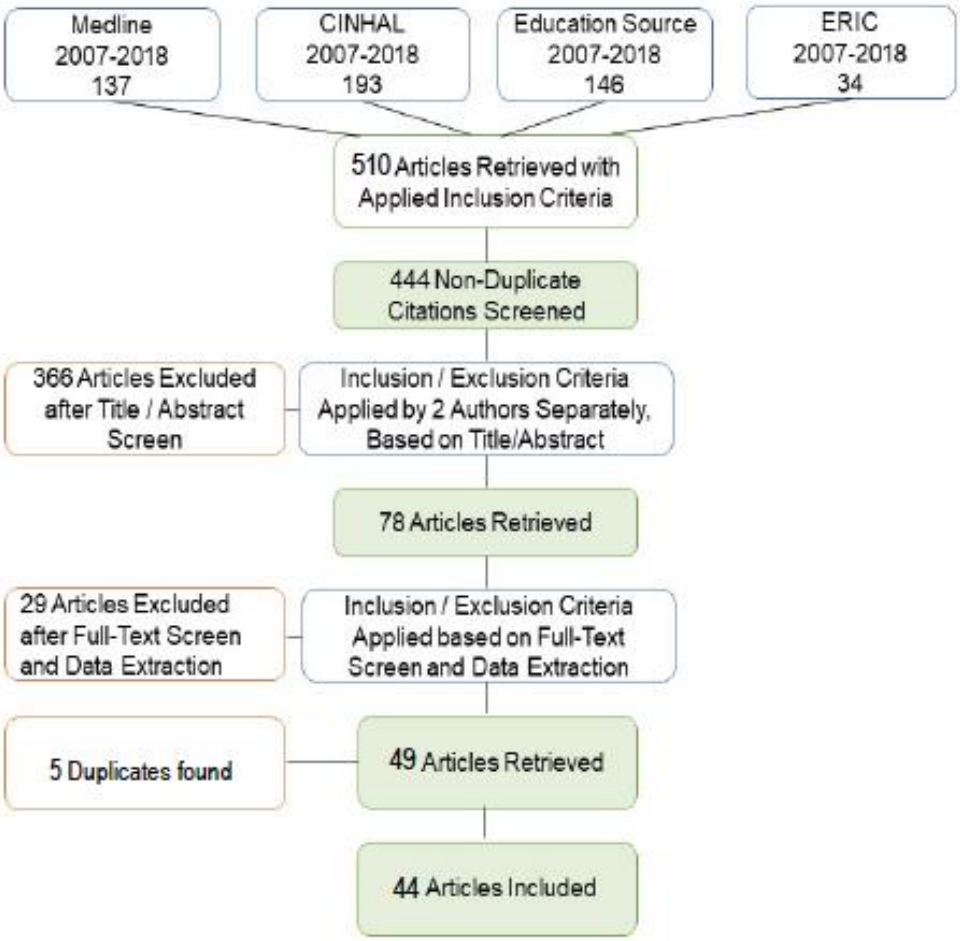
inform students, clinicians, and university professors and act as a guide for the integration of evidence-based knowledge. All team members discussed the results, which made it possible to identify their anticipated benefits, utilities, and implications.

Results

After the application of our selection criteria, 444 papers were identified for our first, second, and third database searches. Of these identified papers, 78 remained eligible based on the title and abstract for each research question. After reading their full texts and verifying for duplicates, 44 papers were selected (see Figure 1). The final sample consisted of five review articles, nine grey literature and 30 research studies. The grey literature included opinion articles and letters.

Figure 1

PRISMA Diagram – Article Selection Process



Description of Important Themes

The team identified seven categories related to best practices for podcast use in health education, with several themes within each category (see Table 1). Because the purpose of this synthesis of the literature was ultimately to guide optimal pedagogical use of podcasting, only the themes identified as important (see Figure 2), whether recurrent or not, will be addressed in the following section. These themes relate to the facilitators and obstacles to podcast use, advantages and disadvantages of podcasts, their potential utility, and elements to consider in podcast creation.

Table 1

References for Each Theme and Theme Categories

Theme (subtheme)	Theme category	Number of references (proportion of overall references)	References
Facilitator to podcast use	**Accessibility and portability**	23 (52.3%)	Alikhan et al., 2010; Andrejco, 2017; Asarbakhsh & Sandars, 2013; Blum, 2014; Cordos & Bolboacă, 2016; Duffy, 2013; Erardi & Hartmann, 2008; Kleinpell, 2011; Matava et al., 2013; Moorefield-Lang, 2017; March et al., 2016; Narayanaswami et al., 2015; Pilcher, 2013; Purdy, 2015; O'Neill et al., 2010; Shantikumar, 2009; Shetty et al., 2011; Stoten, 2007; Thompson et al., 2014; White et al., 2011; White & Sharma, 2012; Young et al., 2011; Zanussi et al., 2012
Obstacles to podcast use (specific to learners)	**Lack of technological know-how**	3 (6.8%)	Andrejco, 2017; Asarbakhsh & Sandars, 2013; Kung & Oh, 2014
	Perception of time-wasting	2 (4.5%)	Asarbakhsh & Sandars, 2013; Kung & Oh, 2014
	Lack of trust in the content	1 (2.3%)	Kung & Oh, 2014
	Limited listening motivation	1 (2.3%)	Pettit, 2017

DOI: 10.26681/jote.2021.050202

Theme (subtheme)	Theme category	Number of references (proportion of overall references)	References
Obstacles to podcast use (specific to podcasts)	Account subscription requirements	3 (6.8%)	Blum, 2014; Kleinpell, 2011; Thompson et al., 2014
	Inter-podcast irregularity	3 (6.8%)	Alikhan et al., 2010; Bednarczyk et al., 2014; Thompson et al., 2014
	Technological dysfunction or incompatibility	3 (6.8%)	Blum, 2014; Duffy, 2013; Stoten, 2007
Advantages of podcasts	**Listening autonomy**	13 (29.5%)	Alikhan et al., 2010; Andrejco, 2017; Blum, 2014; Erardi & Hartmann, 2008; Kleinpell et al., 2011; Kung & Oh, 2014; Matava et al., 2013; Pilcher, 2013; Shantikumar, 2009; Shetty et al., 2011; Stoten, 2007; Thompson et al., 2014; White & Sharma, 2012
	Alternative to reading	6 (13.6%)	Blum, 2014; Cordos & Bolboacă, 2016; Kung & Oh, 2014; Shantikumar, 2009; White et al., 2011; White & Sharma, 2012
	Aid to active learning	6 (13.6%)	Andrejco, 2017; Jalali & Wood, 2012; Shantikumar, 2009; Smith & Morris, 2014; Stoten, 2007; White et al., 2011
	Facilitated access to recent findings	3 (6.8%)	Bednarczyk et al., 2014; Erardi & Hartmann, 2008; Purdy, 2015
Disadvantages of podcasts	**Questionable credibility and quality**	8 (18.2%)	Alikhan et al., 2010; Erardi & Hartmann, 2008; Krishnan et al., 2017; Kung & Oh, 2014; McLaughin & Zanussi, 2012; Purdy, 2015; Thompson et al., 2014; Young et al., 2011

Theme (subtheme)	Theme category	Number of references (proportion of overall references)	References
	One-way communication	6 (13.6%)	Andrejco, 2017; Shantikumar, 2009; Shetty et al., 2011; Smith & Morris, 2014; Stoten, 2007; Zanussi et al., 2012
Effect of podcasts	**Knowledge acquisition**	16 (36.4%)	Alla & Kirkman, 2014; Back et al., 2017; Bhatti et al., 2011; Blum, 2014; Chin et al., 2017; Cordos & Bolboacă, 2016; Hargett, 2018; Kleinpell et al., 2011; Kung & Oh, 2014; Kurien et al., 2013; Miesner et al., 2017; O'Neill et al., 2010; Shaw & Molnar, 2011; Smith & Morris, 2014; Stoten, 2007; Young et al., 2011
	Improved performance	8 (18.2%)	Cordos & Bolboacă, 2016; Jalali & Wood, 2012; Krishnan et al., 2017; March et al., 2016; Purdy et al., 2015; Smith & Morris, 2014; White & Sharma, 2012; Young et al., 2011
	Class absenteeism	2 (4.5%)	Andrejco, 2017; Hargett, 2018
	Reduced gender learning gaps	1 (2.3%)	Back et al., 2017
Potential utility of podcasts	**Learning complement**	9 (20.5%)	Alikhan et al., 2010; Alla & Kirkman, 2014; Hurst, 2016; Shantikumar, 2009; Shetty et al., 2011; Stoten, 2007; Thompson et al., 2014; White et al., 2011; Young et al., 2011
	Continuing education	6 (13.6%)	Duffy, 2013; Erardi & Hartmann, 2008; Kleinpell et al., 2011; Kung & Oh, 2014; Purdy et al., 2015; Stoten, 2007

DOI: 10.26681/jote.2021.050202

Theme (subtheme)	Theme category	Number of references (proportion of overall references)	References
	Virtual collaboration	4 (9.1%)	Bednarczyk et al., 2014; Duffy, 2013; Kung & Oh, 2014; Stoten, 2007
	Patient education	2 (4.5%)	Erardi & Hartmann, 2008; Kung & Oh, 2014
Elements to consider in podcast creation (Podcast type)	**Podcast length**	8 (18.2%)	Andrejco, 2017; Chin et al., 2017; Cho et al., 2017; Kapoor et al., 2018; Matava et al., 2013; Pettit et al., 2017; Sandars, 2009; Stoten, 2007
	Preferred podcast type (interview)	3 (6.8%)	Chin et al., 2017; Cho et al., 2017; Kapoor et al., 2018
Elements to consider in podcast creation (Podcast content)	**Credible content**	8 (18.2%)	Alikhan et al., 2010; Asarbakhsh & Sandars, 2013; Bednarczyk et al., 2014; Cho et al., 2017; Erardi & Hartmann, 2008; Krishnan et al., 2017; Lin et al., 2015; Young et al., 2011
	Relevance to clinical practice	5 (11.4%)	Asarbakhsh & Sandars, 2013; Chin et al., 2017; Pettit et al., 2017; Matava et al., 2013; Stoten, 2007
	Clear explanations	3 (6.8%)	Asarbakhsh & Sandars, 2013; Pettit et al., 2017; Cho et al., 2017
Elements to consider in podcast creation (Possible additions to improve content)	**Practice questions**	2 (4.5%)	Matava et al., 2013; Pettit et al., 2017
	Podcast segmentation	2 (4.5%)	Pettit et al., 2017; Stoten, 2007
	Summary at the end	2 (4,5%)	Asarbakhsh & Sandars, 2013; Chin et al., 2017
Elements to consider in podcast creation	Possibility to manipulate listening features	5 (11.4%)	Asarbakhsh & Sandars, 2013; Kapoor et al., 2018; Pettit et al., 2017; Cho et al., 2017; Sandars, 2009

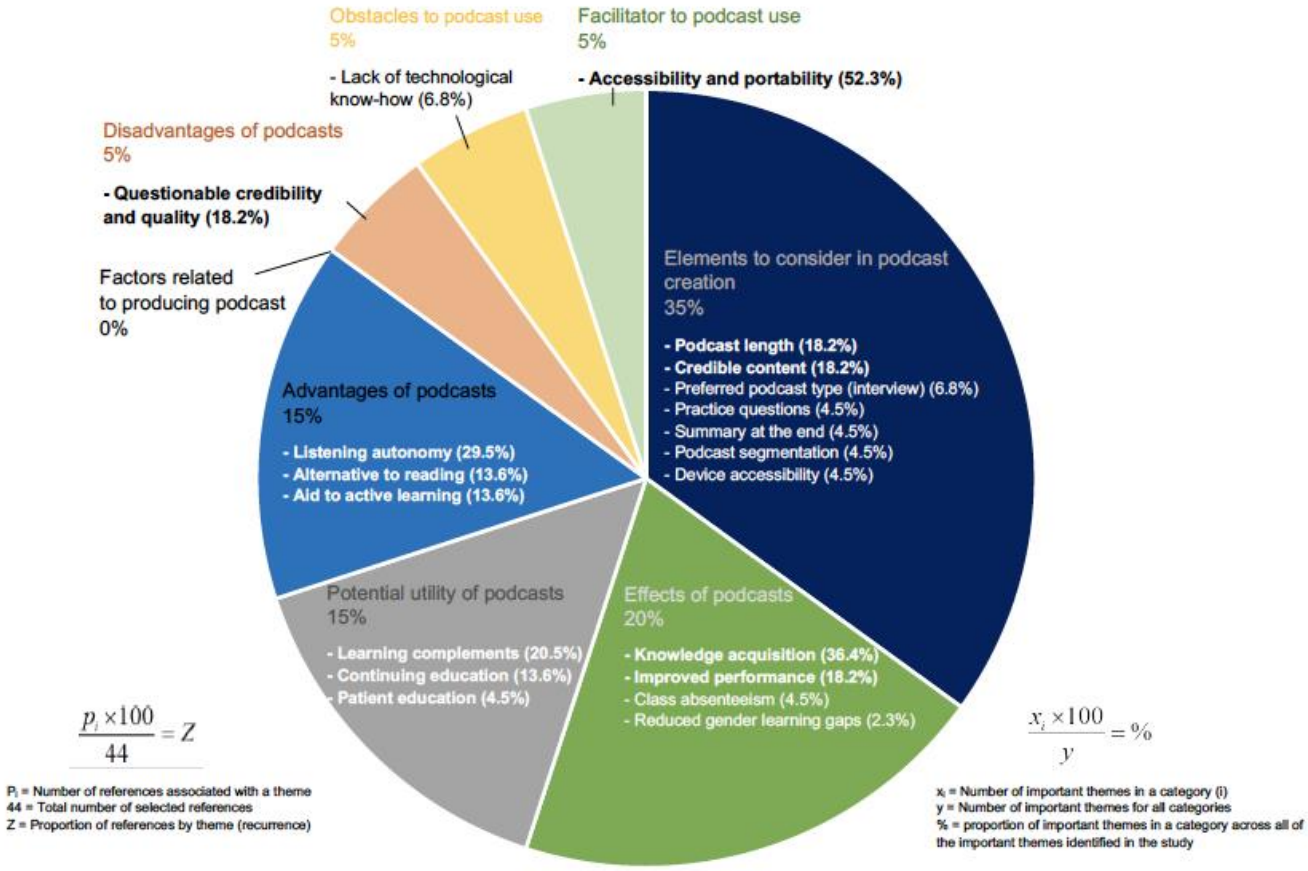
Theme (subtheme)	Theme category	Number of references (proportion of overall references)	References
(Technical aspects of podcasts)	Audio quality	5 (11.4%)	Asarbakhsh & Sandars, 2013; Chin et al., 2017; Pettit et al., 2017; Sandars, 2009; Stoten, 2007
	Visual quality	4 (9.1%)	Asarbakhsh & Sandars, 2013; Chin et al., 2017; Kapoor et al., 2018; Sandars, 2009
	Device accessibility	2 (4.5%)	Lin et al., 2015; Pettit et al., 2017
Elements to consider in podcast creation (Factors related to producing podcasts)	Challenges related to punctual release	5 (11.4%)	Andrejco, 2017; Moorefield-Lang, 2017; Pilcher, 2013; Stoten, 2007; Thompson et al., 2014
	Production ease	5 (11.4%)	Asarbakhsh & Sandars, 2013; McLaughin & Zanussi, 2012; Patasi et al., 2009; Stoten, 2007; White & Sharma, 2012

Note. Themes in **bold** were determined to be important.

DOI: 10.26681/jote.2021.050202

Figure 2

Elements to Consider for Optimal use of Podcasting



Note. Themes in **bold** were determined to be recurrent.

Facilitators to Podcast Use

One facilitator determined to be important as well as recurrent, mentioned in 23 papers (52.3%), was podcasts' **accessibility and portability**. Indeed, these key features allow podcasts to be listened to or viewed anytime, anywhere, and on multiple types of portable devices. Podcasting offers users “the ability to download and listen to broadcasts of interest without being fixed to the computer, making for a truly mobile information resource” (Alikhan et al., 2010, p. 74).

Obstacles to Podcast Use

One obstacle was determined to be important, but not recurrent. Mentioned in three papers (6.8%), **lack of technological know-how**, defined as any negative perception or sense of unfamiliarity regarding the use of technology, is an obstacle specific to learners that may interfere with the use of podcasts. In fact, in one article, it was stated that “many faculty and students may be unfamiliar with the technology” (Andrejco, 2017, p. 11).

Advantages of Podcasts

Three advantages were determined to be important; they were all recurrent. **Listening autonomy** was mentioned in 13 papers (29.5%) and is a feature of podcasts greatly appreciated. In fact, "the benefits of using enhanced podcasts to deliver such materials include the ability to watch [or listen] anytime, anywhere, to pause and rewind, and to view the resource as many times as you would like" (Shantikumar, 2009, p. 538). Listening autonomy also consists of the characteristic of podcasts to be sped up, slowed down, and listened to while engaging in another activity.

Being an **alternative to reading**, mentioned in six papers (13.6%), is an advantage for learners who have a learning disability or low levels of literacy. One author "addresses concerns for students' modes of learning when English is their second language and suggests the use of podcasts where the potential for repetition assists in understanding new material" (Blum, 2014, p. 2). Finally, podcasts act as an **aid to active learning**. Six papers (13.6%) stated that, despite being a passive learning medium, podcasts allow learners, particularly students, to prepare course material in advance to produce a more active learning environment in the classroom. In fact, making podcasts accessible before class allows professors to skip lectures and turn to practical teaching methods during classroom hours: "the time [the professor] saved in not doing the lectures was put toward anatomy laboratories" (Jalali & Wood, 2012, p. 605).

Disadvantages of Podcasts

Mentioned in eight of the papers (18.2%) and thus, recurrent, **questionable credibility and quality** was the only disadvantage of learning with podcasts that was determined important. Podcast regulation currently does not exist. Therefore, the information it shares may not be accurate and may contain bias, conflicts of interest, or may not be evidence-based. It was explained in one article that, "without proper regulation, industry may influence podcasts, clouding the boundaries between fact and advertisement" (Alikhan et al., 2010, p. 78).

Outcomes of Podcasts Use

Three effects were determined to be important, two of which were recurrent. Podcasts allow for **knowledge acquisition**, an effect mentioned in 16 papers (36.4%). One study found that "knowledge increased [after listening to a podcast], significantly improving [test scores] from 36% prior to podcasts to 76% following podcasts ($p = 0.001$)" (Miesner et al., 2017, p. 686). Another study, which compared learning from podcasts and from two established textbooks on orthopedics and traumatology, showed that knowledge acquisition was significantly higher in podcast listeners than in book readers (Back et al., 2017). Podcasts have also been shown to **improve performance** of learners as mentioned in eight papers (18.2%). In fact, "students were enthusiastic about the impact of podcasts on learning with 90% claiming to concentrate more in lectures" (Smith & Morris, 2014, p. 9). Finally, podcasts may increase **class absenteeism** of students; however, this finding was only mentioned in two papers (4.5%). Indeed, according to one study, "only 3% of students claimed to have missed the occasional lecture if podcasts were available while no students reported missing lectures regularly due to the availability of podcasts" (Smith & Morris, 2014, p. 9).

DOI: 10.26681/jote.2021.050202

Potential Utility of Podcasts

Three potential utilities were determined to be important. One was recurrent. As mentioned in six articles (13.6%), podcasts can be used for **continuing education** purposes by updating learning and practice of clinicians after graduation from university. In one article, it was suggested "that clinicians are increasingly keen to receive their CPD (Continued Professional Development) material in audio format" (March et al., 2016, p. 6). In another, which focuses on the benefits of podcasting specifically with dermatologists, it was stated that podcasts can be used as clinically relevant, evidence-based resources and encourages prestigious journals to become more involved in developing them (Alikhan et al., 2010). Two articles (4.5%) supported the fact that podcasts can also be used for **patient education** and population health literacy. For example, giving instructions for home programs could be a potential use of podcasts (Erardi & Hartmann, 2008). Finally, nine articles (20.5%) supported the fact that podcasts can be used as **learning complements**, meaning they can be used as an addition to traditional learning methods. For example, they can be used as an "introduction to learn topics which are difficult to start reading about" (White et al., 2011, p. 942).

Elements to Consider in Podcast Creation

Seven elements were determined to be important in podcast creation for the optimization of learning and teaching, two of which were recurrent. In three papers (6.8%), it was said that "[**interview-style podcasts** conducted by a professional interviewer] help maintain student engagement" (Kapoor et al., 2018, p. 137). Considering that rates of speech, cadence, and style are important in optimizing listeners' attention, it is suggested that a presenter reading off a script be avoided (Kapoor et al., 2018). Eight articles (18.2%) suggested that **podcast length** is also to be considered, with most papers suggesting that podcasts lasting less than 30 minutes were optimal for sustained concentration, as mentioned in one study: "the majority of participants who stated a preference in podcast length indicated they preferred podcasts of 30 minutes or less (85%)" (Chin et al., 2017, p. 1).

Another element to consider is podcast content. Eight papers (18.2%) deemed it important that podcasts cover **credible content**, meaning that it is accurate, without conflict of interest and coming from referenced sources. However, "there is currently no coordination or standardization resulting in variable quality across resources" (Thompson et al., 2014, p. 156). Additional elements that may be incorporated in order to optimize learning and which are mentioned in two articles (4.5%), are **summaries at the end** as they may "reinforce the material throughout the podcast, considering that listeners may not be physically taking notes" (Chin et al., 2017, p. 6). **Practice questions** were mentioned in two articles (4.5%). For instance, "multiple-choice quizzes, are [a] tool that may be used to facilitate deep learning" (Asarbakhsh & Sandars, 2013, p. 49). As well, **podcast segmentations,** mentioned in two articles (4.5%), which are breaks or pauses incorporated between successive segments of a presentation, "help restore attention [and] organize and integrate" (Pettit et al., 2017, p.

11). Finally, as mentioned in two articles (4.5%), it is important for creators to ensure **device accessibility**, which is the characteristic of being accessible and compatible on every platform and available with standard equipment (Lin et al., 2015).

Discussion

This study identified and synthesized the factors considered to be important in podcast use and conception in learning contexts. These results can be integrated by occupational therapy students, clinicians, and professors in their practices.

Firstly, our findings show that podcasts are useful mediums of knowledge acquisition when used as a learning complement to other teaching modalities. They can be helpful in consolidating existing knowledge or introducing new ones; however, they should not be used to replace traditional methods, such as lectures and class discussions. This conclusion concurs with the fact that the learning process is optimized through a various assortment of tasks and inputs (Green & Bavelier, 2008). Therefore, using multiple learning modalities, such as reading, asking questions, and listening to podcasts, aids in reinforcing knowledge acquirements.

As well as being a good learning complement, podcasts offer many distinguishing and appreciated features, the main ones being their accessibility and portability. These features allow listeners to learn at their own pace by taking breaks, listening to the subject matter while engaging in another activity and skipping or repeating sections or the entirety of the podcast. This latter possibility might be helpful for evidence-based knowledge integration because learners recall more information when the content is presented multiple times (Bromage & Mayer, 1986).

Despite their many advantages, some negative aspects of podcast use were identified. Firstly, it is common sense to suppose that podcast availability can increase class absenteeism. However, this effect was only listed in two articles retrieved. Another disadvantage of learning through podcasts is its “one-way communication” feature. However, although recurrent, this aspect was not determined to be important because it is not specific to podcasts and can be applied to reading, a very traditional learning modality. Conversely, many articles suggested that although a passive learning medium, podcasts may actually act as an aid to active learning as they allow learners to prepare material in advance so that their time with other students, teachers or colleagues can be more interactive. Furthermore, students have mentioned that podcast recordings offer a “great introduction to learn topics which are difficult to start reading about” (White et al., 2011, p. 942).

Of the disadvantages of podcasts identified in this study, the only one determined to be important was the risk of questionable credibility and quality. In fact, since podcast regulation is currently lacking, there is no way to ensure that the information disseminated is evidence-based. The quality of the broadcasted content can therefore be variable. One potential way in which learning can be optimized through the use of podcasts would be if peer-reviewed resources, such as journals, databases or publishing companies, became more involved in developing them. If this were the case,

DOI: 10.26681/jote.2021.050202

podcasts could become an excellent means of disseminating, acquiring, and applying evidence-based practices, since they have been shown to be good learning complements, as mentioned above.

Finally, in order for podcasts to be effective in knowledge dissemination and acquisition, certain elements are to be considered in their creation process in order to optimize listeners' attention and learning ability. Although many articles suggest the importance of ideal podcast length, inconsistencies remain in the literature. The majority of articles retrieved state that podcast length should not exceed 30 minutes, mainly to optimize sustained concentration and listening motivation. However, within this duration range, the variability is high. Therefore, no specific optimal length can be determined. The length is important as it influences the retention of the information depending on the attention capacity of the learner. Eze and Edward (2017) mentioned that "science has shown us that effective human attention spans last for 10 to 15 minutes at any given time." An argument for longer length podcasts is related to the listening autonomy, which allows the learners to pause the podcast after 15 minutes or when their attention decreases. To our knowledge, no article suggests that argument.

Strengths and Limitations

This study covers an innovative subject and takes stock of several elements that have never been put forward in the literature. The methodology of the study was rigorous, and the assiduity of the members to ensure this rigor is one of its strengths. Indeed, each step of the methodology followed a principle of double verification. Also, the presented data stems from numerous articles of different types and scope. Quantitative results were complemented by the qualitative results, which provided explanations for gaps between promising and current practices.

As for limitations, the subjective nature of the process by which theme-importance was determined must be considered. Furthermore, as with other scoping reviews (Arksey & O'Malley, 2005), this study did not provide a detailed appraisal of the quality of the evidence. Indeed, grey literature, such as opinion articles and letters, were included in this scoping study. Grey literature was not sourced outside of traditional databases, and we did not expand our search through reference lists of identified articles. Thus, it is possible that relevant documents were omitted from our research Also, of the studies included, 71.9% were based on research done by means of surveys or focus groups, meaning that their results offer information on participant preference and subjective experience. Although these studies provide helpful information for tailoring podcasts to meet targeted audience needs and preferences, the results do not provide robust evidence regarding which characteristics support knowledge acquisition most effectively.

Conclusion

The purpose of this review was to offer occupational therapy students, clinicians, and professors a synthesis of the literature regarding teaching and learning by means of podcasting. There is a general consensus in the literature supporting the fact that podcasts are appropriate and innovative learning tools aiding in knowledge retention

and improved practical performance. As well, being easily accessible and portable, podcasts offer many advantages distinguishing them from other more traditional learning modalities. That being said, podcasts are most effective when used complementarily to other learning modalities and should not be used as a substitute for class attendance or interactive learning opportunities.

For the reasons stated, the introduction of podcasts in clinical or university settings is promising and is currently on the rise. As well, an interesting benefit of podcast use that, to our knowledge, has not yet been addressed in the literature, is its very small environmental footprint. In fact, academic institutions are becoming more aware of their social responsibility and look for ways to provide more sustainable learning opportunities. Using podcasts as a complement to traditional learning modalities may help academic institutions move in this direction by reducing the amount of paper used and the transportation emissions linked with this industry. Further research on this topic would be pertinent as it is an unexplored potential advantage of podcasts.

Despite the general agreement associated with podcast use, most of the literature covering the topic does not provide robust evidence linking it with effective teaching and learning of evidence-based knowledge and practices. Thereby, additional research leading to objective conclusions on the best practices for this technology would also be relevant.

References

Alikhan, A., Kaur, R. R., & Feldman, S. R. (2010). Podcasting in dermatology education. *Journal of Dermatological Treatment*, *21*(2), 73-79. https://doi.org/10.1080/09546630902936786

Andrejco, K. (2017). Social media in nurse anesthesia: A model of a reproducible educational podcast. *American Association of Nurses Anesthetists Journal*, *85*(1).

Arksey, H., & O'Malley, L. (2005). Scoping studies: towards a methodological framework. *International Journal of Social Research Methodology*, *8*(1), 19-32. https://doi.org/10.1080/1364557032000119616

Asarbakhsh, M., & Sandars, J. (2013). E-learning: The essential usability perspective. *The Clinical Teacher*, *10*(1), 47-50. https://doi.org/10.1111/j.1743-498X.2012.00627.x

Back, D. A., von Malotky, J., Sostmann, K., Hube, R., Peters, H., & Hoff, E. (2017). Superior gain in knowledge by podcasts versus text-based learning in teaching orthopedics: A randomized controlled trial. *Journal of Surgical Education*, *74*(1), 154-160. https://doi.org/10.1016/j.jsurg.2016.07.008

Blum, C. A. (2014). Evaluating preceptor perception of support using educational podcasts. *International Journal of Nursing Education Scholarship*, *11*(1), 47-54. https://doi.org/10.1515/ijnes-2013-0037

Boruff, J. T., & Thomas, A. (2011). Integrating evidence-based practice and information literacy skills in teaching physical and occupational therapy students. *Health Information & Libraries Journal*, *28*(4), 264-272. https://doi.org/10.1111/j.1471-1842.2011.00953.x

Bozzolan, M., Simoni, G., Balboni, M., Fiorini, F., Bombardi, S., Bertin, N., & Da Roit, M. (2014). Undergraduate physiotherapy students' competencies, attitudes and perceptions after integrated educational pathways in evidence-based practice: A mixed methods study. *Physiotherapy Theory and Practice*, *30*(8), 557-571. https://doi.org/10.3109/09593985.2014.910285

Bromage, B. K., & Mayer, R. E. (1986). Quantitative and qualitative effects of repetition on learning from technical text. *Journal of Educational Psychology*, *78*(4), 271. https://doi.org/10.1037/0022-0663.78.4.271

Buetow, S. (2010). Thematic analysis and its reconceptualization as 'saliency analysis'. *Journal of Health Services Research & Policy*, *15*(2), 123-125. https://doi.org/10.1037/0022-0663.78.4.271

Center of Evidence-Based Medicine. (n.d.) *Asking focused questions.* https://www.cebm.net/2014/06/asking-focused-questions/

Chin, A., Helman, A., & Chan, T. M. (2017). Podcast use in undergraduate medical education. *Cureus*, *9*(12). https://doi.org/10.7759/cureus.1930

Coomarasamy, A., Taylor, R., & Khan, K. (2003). A systematic review of postgraduate teaching in evidence-based medicine and critical appraisal. *Medical Teacher*, *25*(1), 77-81. https://doi.org/10.1080/0142159021000061468

Eonta, A. M., Christon, L. M., Hourigan, S. E., Ravindran, N., Vrana, S. R., & Southam-Gerow, M. A. (2011). Using everyday technology to enhance evidence-based treatments. *Professional Psychology: Research and Practice*, *42*(6), 513. https://doi.org/10.1037/a0025825

Erardi, L. K., & Hartmann, K. (2008). Blogs, wikis and podcasts: Broadening our connections for communication, collaboration and continuing education. *OT Practice*, *13*(9), 1-7.

Eze, C., & Misava, E. (2017). Lecture duration: A risk factor for quality teaching and learning in Higher Education*. Integrity Journal of Education and Training, 1*, 1. https://doi.org/10.31248/IJET2017.006

Green, C. S., & Bavelier, D. (2008). Exercising your brain: A review of human brain plasticity and training-induced learning. *Psychology and Aging*, *23*(4), 692. https://doi.org/10.1037/a0014345

Hargett, J. L. (2018). Podcasting in nursing education: Using commercially prepared podcasts to spark learning. *Teaching and Learning in Nursing*, *13*(1), 55-57. https://doi.org/10.1016/j.teln.2017.08.003

Horsley, T., Hyde, C., Santesso, N., Parkes, J., Milne, R., & Stewart, R. (2011). Teaching critical appraisal skills in healthcare settings. *Cochrane Database of Systematic Reviews*, (11). https://doi.org/10.1002/14651858.CD001270.pub2

Hughes, R. (Ed.). (2008). *Patient safety and quality: An evidence-based handbook for nurses* (Vol. 3). Rockville, MD: Agency for Healthcare Research and Quality.

Jalali, A., & Wood, T. J. (2012). Podcasting as a goal oriented toy in education. *Advances in Health Sciences Education*, *17*(4), 605-606. https://doi.org/10.1007/s10459-012-9362-3

Kapoor, S., Catton, R., & Khalil, H. (2018). An evaluation of medical student-led podcasts: what are the lessons learnt?. *Advances in Medical Education and Practice*, *9*, 133. https://doi.org/10.2147/AMEP.S148513

Kazlauskas, A., & Robinson, K. (2012). Podcasts are not for everyone. *British Journal of Educational Technology*, *43*(2), 321-330. https://doi.org/10.1111/j.1467-8535.2010.01164.x

Lee, M. J., McLoughlin, C., & Chan, A. (2008). Talk the talk: Learner-generated podcasts as catalysts for knowledge creation. *British Journal of Educational Technology*, *39*(3), 501-521. https://doi.org/10.1111/j.1467-8535.2007.00762.x

Lin, M., Thoma, B., Trueger, N. S., Ankel, F., Sherbino, J., & Chan, T. (2015). Quality indicators for blogs and podcasts used in medical education: Modified Delphi consensus recommendations by an international cohort of health professions educators. *Postgraduate Medical Journal*, *91*(1080), 546-550. https://doi.org/10.1136/postgradmedj-2014-133230

March, J., Chew, J., Rattenbury, C., & Tyer, R. (2016). The Physio Matters Podcast. *Physiotherapy*, *102*, e6. https://doi.org/10.1016/j.physio.2016.10.010

McLoughlin, C., Lee, M. J., & Chan, A. (2006, October). Fostering reflection and metacognition through student-generated podcasts. In *Proceedings of the Australian Computers in Education Conference (ACEC 2006)* (pp. 1-8).

Meade, O., Bowskill, D., & Lymn, J. S. (2011). Pharmacology podcasts: a qualitative study of non-medical prescribing students' use, perceptions and impact on learning. *BMC Medical Education*, *11*(1), 1-10. https://doi.org/10.1186/1472-6920-11-2

Miesner, A. R., Lyons, W., & McLoughlin, A. (2017). Educating medical residents through podcasts developed by PharmD students. *Currents in Pharmacy Teaching and Learning*, *9*(4), 683-688. https://doi.org/10.1016/j.cptl.2017.03.003

Morris, Z. S., Wooding, S., & Grant, J. (2011). The answer is 17 years, what is the question: understanding time lags in translational research. *Journal of the Royal Society of Medicine*, *104*(12), 510-520. https://doi.org/10.1258/jrsm.2011.110180

Nzabonimpa, J. P. (2018). Quantitizing and qualitizing (im-) possibilities in mixed methods research. *Methodological Innovations*, *11*(2), 2059799118789021. https://doi.org/10.1177%2F2059799118789021

Patton, M. Q. (1990). *Qualitative evaluation and research methods* (2nd ed.). Sage Publications, inc.

Pettit, R. K., Kinney, M., & McCoy, L. (2017). A descriptive, cross-sectional study of medical student preferences for vodcast design, format and pedagogical approach. *BMC Medical Education*, *17*(1), 89. https://doi.org/10.1186/s12909-017-0926-z

Powell, L., & Robson, F. (2014). Learner-generated podcasts: A useful approach to assessment?. *Innovations in Education and Teaching International*, *51*(3), 326-337. https://doi.org/10.1080/14703297.2013.796710

Salloum, A., & Smyth, K. (2013). Clinicians' experiences of a podcast series on implementing a manualized treatment. *Journal of Technology in Human Services*, *31*(1), 71-83. https://doi.org/10.1080/15228835.2012.738382

Shantikumar, S. (2009). From lecture theatre to portable media: Students' perceptions of an enhanced podcast for revision. *Medical Teacher*, *31*(6), 535-538. https://doi.org/10.1080/01421590802365584

Smith, K., & Morris, N. P. (2014). Evaluation of biomedical science students use and perceptions of podcasting. *Bioscience Education*, *22*(1), 3-15. https://doi.org/10.11120/beej.2014.00024

Thomas, A., & Law, M. (2013). Research utilization and evidence-based practice in occupational therapy: A scoping study. *American Journal of Occupational Therapy*, *67*(4), e55-e65. https://doi.org/10.5014/ajot.2013.006395

Thompson, H. J., Belza, B., Baker, M., Christianson, P., Doorenbos, A., & Nguyen, H. (2014). Identifying and evaluating electronic learning resources for use in adult-gerontology nurse practitioner education. *Journal of Professional Nursing*, *30*(2), 155-161. https://doi.org/10.1016/j.profnurs.2013.08.004

Upton, D., Stephens, D., Williams, B., & Scurlock-Evans, L. (2014). Occupational therapists' attitudes, knowledge, and implementation of evidence-based practice: A systematic review of published research. *British Journal of Occupational Therapy*, 77(1), 24–38. https://doi.org/10.4276/030802214X13887685335544

White, J. S., Sharma, N., & Boora, P. (2011). Surgery 101: Evaluating the use of podcasting in a general surgery clerkship. *Medical Teacher*, *33*(11), 941-943. https://doi.org/10.3109/0142159X.2011.588975

Appendix

Articles included in the scoping study (n = 44)

Alikhan, A., Kaur, R. R., & Feldman, S. R. (2010). Podcasting in dermatology education. *Journal of Dermatological Treatment*, *21*(2), 73-79. https://doi.org/10.1080/09546630902936786

Alla, A., & Kirkman, M. A. (2014). PodMedPlus: An online podcast resource for junior doctors. *Medical Education*, *11*(48), 1126-1127. https://doi.org/10.1111/medu.12556

Andrejco, K. (2017). Social media in nurse anesthesia: A model of a reproducible educational podcast. *American Association of Nurse Anesthetists Journal*, *85*(1).

Asarbakhsh, M., & Sandars, J. (2013). E-learning: The essential usability perspective. *The Clinical Teacher*, *10*(1), 47-50. https://doi.org/10.1111/j.1743-498X.2012.00627.x

Back, D. A., von Malotky, J., Sostmann, K., Hube, R., Peters, H., & Hoff, E. (2017). Superior gain in knowledge by podcasts versus text-based learning in teaching orthopedics: A randomized controlled trial. *Journal of Surgical Education*, *74*(1), 154-160. https://doi.org/10.1016/j.jsurg.2016.07.008

Bednarczyk, J., Pauls, M., Fridfinnson, J., & Weldon, E. (2014). Characteristics of evidence-based medicine training in Royal College of Physicians and Surgeons of Canada emergency medicine residencies-A national survey of program directors. *BMC Medical Education*, *14*(1), 57. https://doi.org/10.1186/1472-6920-14-57

Bhatti, I., Jones, K., Richardson, L., Foreman, D., Lund, J., & Tierney, G. (2011). E-learning vs lecture: which is the best approach to surgical teaching?. *Colorectal Disease*, *13*(4), 459-462. https://doi.org/10.1111/j.1463-1318.2009.02173.x

Blum, C. A. (2014). Evaluating preceptor perception of support using educational podcasts. *International Journal of Nursing Education Scholarship*, *11*(1), 47-54. https://doi.org/10.1515/ijnes-2013-0037

Chin, A., Helman, A., & Chan, T. M. (2017). Podcast use in undergraduate medical education. *Cureus*, *9*(12). https://doi.org/10.7759/cureus.1930

Cho, D., Cosimini, M., & Espinoza, J. (2017). Podcasting in medical education: A review of the literature. *Korean Journal of Medical Education*, *29*(4), 229. https://doi.org/10.3946/kjme.2017.69

Cordoş, A. A., & Bolboacă, S. D. (2016). Social media use among nurses: Literature review. *Studies in Health Technology and Informatics*, *225*, 572-576. https://doi.org/10.3233/978-1-61499-658-3-572

Duffy, M. (2013). Podcasts for the uninitiated. *American Journal of Nursing*, *113*(10), 63-66. https://doi.org/10.1097/01.NAJ.0000435352.61158.29

Erardi, L. K., & Hartmann, K. (2008). Blogs, wikis and podcasts: Broadening our connections for communication, collaboration and continuing education. *OT Practice*, *13*(9), 1-7.

Hargett, J. L. (2018). Podcasting in nursing education: Using commercially prepared podcasts to spark learning. *Teaching and Learning in Nursing*, *13*(1), 55-57. https://doi.org/10.1016/j.teln.2017.08.003

Hurst, K. M. (2016). Using video podcasting to enhance the learning of clinical skills: A qualitative study of physiotherapy students' experiences. *Nurse Education Today*, *45*, 206-211. https://doi.org/10.1016/j.nedt.2016.08.011

Jalali, A., & Wood, T. J. (2012). Podcasting as a goal oriented toy in education. *Advances in Health Sciences Education*, *17*(4), 605-606. https://doi.org/10.1007/s10459-012-9362-3

Kapoor, S., Catton, R., & Khalil, H. (2018). An evaluation of medical student-led podcasts: What are the lessons learnt?. *Advances in Medical Education and Practice*, *9*, 133 https://doi.org/10.2147/AMEP.S148513

Kleinpell, R., Ely, E. W., Williams, G., Liolios, A., Ward, N., & Tisherman, S. A. (2011). Web-based resources for critical care education. *Critical Care Medicine*, *39*(3), 541-553. https://doi.org/10.1097/CCM.0b013e318206b5b5

Krishnan, K., Thoma, B., Trueger, N. S., Lin, M., & Chan, T. M. (2017). Gestalt assessment of online educational resources may not be sufficiently reliable and consistent. *Perspectives on Medical Education*, *6*(2), 91-98. https://doi.org/10.1007/s40037-017-0343-3

Kung, Y. M., & Oh, S. (2014). Characteristics of nurses who use social media. *Computers, Informatics, Nursing*, *32*(2), 64-72. https://doi.org/10.1097/CIN.0000000000000033

Kurien, G., Biron, V. L., Campbell, C., Cote, D. W., & Ansari, K. (2013). Can a multisensory teaching approach impart the necessary knowledge, skills, and confidence in final year medical students to manage epistaxis?. *Journal of Otolaryngology-Head & Neck Surgery*, *42*(1), 51. https://doi.org/10.1186/1916-0216-42-51

Lin, M., Thoma, B., Trueger, N. S., Ankel, F., Sherbino, J., & Chan, T. (2015). Quality indicators for blogs and podcasts used in medical education: Modified Delphi consensus recommendations by an international cohort of health professions educators. *Postgraduate Medical Journal*, *91*(1080), 546-550. https://doi.org/10.1136/postgradmedj-2014-133230

March, J., Chew, J., Rattenbury, C., & Tyer, R. (2016). The physio matters podcast. *Physiotherapy*, *102* (Supplement 1), e6. https://doi.org/10.1016/j.physio.2016.10.010

Matava, C. T., Rosen, D., Siu, E., & Bould, D. M. (2013). eLearning among Canadian anesthesia residents: A survey of podcast use and content needs. *BMC Medical Education*, *13*(1), 59. https://doi.org/10.1186/1472-6920-13-59

McLaughlin, K., & Zanussi, L. (2012). Taking the middle path in evaluating technology in medical education. *Advances in Health Sciences Education*, *17*(4), 607-609. https://doi.org/10.1007/s10459-012-9378-8

Miesner, A. R., Lyons, W., & McLoughlin, A. (2017). Educating medical residents through podcasts developed by PharmD students. *Currents in Pharmacy Teaching and Learning*, *9*(4), 683-688. https://doi.org/10.1016/j.cptl.2017.03.003

Moorefield-Lang, H. M. (2017). Delivering the message: Disseminating information and professional development in the field of librarianship through technology. *Library Hi Tech*, *35*(1), 81–91. https://doi.org/10.1108/LHT-04-2016-0039

Narayanaswami, P., Gronseth, G., Dubinsky, R., Penfold-Murray, R., Cox, J., Bever Jr, C., Martins, Y., Rheaume, C., Shouse, D., & Getchius, T. S. (2015). The impact of social media on dissemination and implementation of clinical practice guidelines: A longitudinal observational study. *Journal of Medical Internet Research*, *17*(8), e193. https://doi.org/10.2196/jmir.4414

O'Neill, E., Power, A., Stevens, N., & Humphreys, H. (2010). Effectiveness of podcasts as an adjunct learning strategy in teaching clinical microbiology among medical students. *Journal of Hospital Infection*, *75*(1), 83-84. https://doi.org/10.1016/j.jhin.2009.11.006

Patasi, B., Boozary, A., Hincke, M., & Jalali, A. (2009). The utility of podcasts in Web 2.0 human anatomy. *Medical Education*, *43*(11), 1116-1116. https://doi.org/10.1111/j.1365-2923.2009.03471.x

Pettit, R. K., Kinney, M., & McCoy, L. (2017). A descriptive, cross-sectional study of medical student preferences for vodcast design, format and pedagogical approach. *BMC Medical Education*, *17*(1), 89. https://doi.org/10.1186/s12909-017-0926-z

Pilcher, J. (2013). Learning preferences among neonatal and maternal child nurses. *Neonatal Network*, *32*(2), 117-119. https://doi.org/10.1891/0730-0832.32.2.117

Purdy, E., Thoma, B., Bednarczyk, J., Migneault, D., & Sherbino, J. (2015). The use of free online educational resources by Canadian emergency medicine residents and program directors. *Canadian Journal of Emergency Medicine*, *17*(2), 101-106. https://doi.org/10.1017/cem.2014.73

Sandars, J. (2009). Twelve tips for using podcasts in medical education. *Medical Teacher*, *31*(5), 387-389. https://doi.org/10.1080/01421590802227958

Shantikumar, S. (2009). From lecture theatre to portable media: students' perceptions of an enhanced podcast for revision. *Medical Teacher*, *31*(6), 535-538. https://doi.org/10.1080/01421590802365584

Shaw, G. P., & Molnar, D. (2011). Non-native English language speakers benefit most from the use of lecture capture in medical school. *Biochemistry and Molecular Biology Education*, *39*(6), 416-420. https://doi.org/10.1002/bmb.20552

Shetty, N., Bin Reza, F., & Tomkinson, P. (2011). Infection diseases teaching for medical students: Do podcasts work? *Medical Teacher, 33*(7), 592–5.

Smith, K., & Morris, N. P. (2014). Evaluation of biomedical science students' use and perceptions of podcasting. *Bioscience Education*, *22*(1), 3-15. https://doi.org/10.11120/beej.2014.00024

Stoten, S. (2007). Using podcasts for nursing education. *Journal of Continuing Education in Nursing*, *38*(2), 56-57. https://doi.org/10.3928/00220124-20070301-09

Thompson, H. J., Belza, B., Baker, M., Christianson, P., Doorenbos, A., & Nguyen, H. (2014). Identifying and evaluating electronic learning resources for use in adult-gerontology nurse practitioner education. *Journal of Professional Nursing*, *30*(2), 155-161. https://doi.org/10.1016/j.profnurs.2013.08.004

White, J., & Sharma, N. (2012). Podcasting: A technology, not a toy. *Advances in Health Sciences Education*, *17*(4), 601-603. https://doi.org/10.1007/s10459-012-9361-4

White, J. S., Sharma, N., & Boora, P. (2011). Surgery 101: Evaluating the use of podcasting in a general surgery clerkship. *Medical Teacher*, *33*(11), 941-943. https://doi.org/10.3109/0142159X.2011.58897

Young, K. J., Kim, J. J., Yeung, G., Sit, C., & Tobe, S. W. (2011). Physician preferences for accredited online continuing medical education. *Journal of Continuing Education in the Health Professions*, *31*(4), 241-246. https://doi.org/10.1002/chp.20136

Zanussi, L., Paget, M., Tworek, J., & McLaughlin, K. (2012). Podcasting in medical education: Can we turn this toy into an effective learning tool? *Advances in Health Sciences Education*, *17*(4), 597-600. https://doi.org/10.1007/s10459-011-9300-9

DOI: 10.26681/jote.2021.050202