

Educational Podcasts in Kinesiology: A Scoping Review

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Educational podcasts are developed specifically for learning purposes. Preliminary research suggests that many college courses and practitioners regularly use educational podcasts and that this medium is a beneficial tool to use to supplement the learning process. However, there is limited scholarly work examining the use of educational podcasts within kinesiology fields. Thus, the purpose of this study was to conduct a scoping review of the literature on the use of educational podcasts in the field of kinesiology. The Preferred Reporting Items for Systematic Reviews extension for Scoping Reviews Checklist guided this investigation. Six databases were searched. Fourteen articles met the full inclusion criteria. Of these, 11 were data-driven research articles, and three were practitioner articles. Much of the research identified lacked critical information related to research design, instrument development, and findings. Thus, the authors recommend that more rigorous research in this area be conducted to discern the impact of educational podcasts within the field of kinesiology.

Keywords: e-learning, physical education, sport sciences, supplemental learning

Many governing bodies and societies within the field of kinesiology regularly provide professional development (PD), which is perceived as a beneficial mechanism for knowledge sharing and dissemination. However, practitioners and college students often encounter significant barriers to attending PD. For example, York, Gastin, and Dawson (2014) interviewed six sport scientists about their PD attendance, and it was found that although attendance was perceived highly worthwhile in developing their professional network, it came at both a time and financial cost. It is well established that practitioners and college students within the field of kinesiology value different forms of learning, and a body of literature exists, which suggests that informal learning situations are valued more than formal education programs (e.g., Beddoes, Prusak, & Barney, 2019; Blackett, Evans, & Piggott, 2017). Online settings and e-learning tools may offer a viable alternative learning opportunity for practitioners and students within the field of kinesiology to engage with relevant content that may have been previously available only to them through professional conferences or face-to-face college courses.

Online learning settings differ from traditional face-to-face learning as it offers the ability to overcome barriers related to accessibility, cost, and a lack of experts in a geographical area (Valian & Emami, 2013). There is a growing amount of research demonstrating the effectiveness of learning within online settings for bridging knowledge gaps among a variety of professional disciplines (e.g., Healy, Block, & Kelly, 2020; Valian & Emami, 2013). For example, Sato and Haegele (2018) investigated physical educators' engagement within an online PD program that focused on adapted physical education (PE) concepts. The online PD was developed using well-established adult learning principles. Through the use of interviews, peer-review feedback assignments, and reflection logs, it was established that the participants had positive and meaningful engagements within the online PD. This study demonstrates that learning within online settings, when well designed,

can provide significant learning opportunities that could substitute traditional face-to-face learning. Although the use of learning within online settings has been widespread within the field of kinesiology, it has also been suggested that there is a lack of research examining how to implement specific mechanisms and components associated with learning in these settings (McNamara & Haegele, 2020; Sato & Haegele, 2018).

Educational Podcasts

Podcasts deliver digital content through audio and visual mediums. Podcasts often are dispersed via the Internet through a variety of media devices, such as laptops and smartphones (Hew, 2008). In addition, podcasts have become an increasingly prevalent e-learning tool (Drew, 2017; Healy et al., 2020; Kay, 2012; Kennedy, Rodgers, Romig, Mathews, & Peeples, 2017; McNamara, Dillon, Becker, Healy, & Trujillo-Jenks, 2020). In this context, one of the most widely reported reasons for podcast usage is its flexibility and personalization (Healy et al., 2020). Podcasts are an educational phenomenon, with social and "media-rich" features that exemplify the uniqueness and broad appeal of learning within online settings.

"Educational podcast" is a commonly used term to describe podcasts that are specifically designed to impact learning (Drew, 2017; McNamara, et al., 2020). Educational podcasts are often produced by a teacher as a component of formal online learning materials, or they can be open-access podcasts, which are podcasts that are freely available to the public (Fronek, Boddy, Chenoweth, & Clark, 2016; McNamara & Haegele, 2020). This medium enables listeners to be more in control of their learning, as podcasts allow the listener to pause, rewind, and listen to content as often as necessary to properly learn the content (Drew, 2017; Kay, 2012). Educational podcasts, especially open-access podcasts, also have the ability to increase relationships and deepen learners' communities of practice (Lave, Wenger, & Wenger, 1991), which are often absent in online settings. More precisely, educational podcasts can be an informal method of disseminating profession-specific knowledge and helping to "build stronger relationships between theory, research, and practice in the space between formal learning and entertainment" (Fronek et al., 2016, p. 113). Listening to educational

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podcasts allows listeners to hear the concerns and strategies of like-minded practitioners. In addition, podcasts can encourage online communication through social media networks (Wrather, 2016) and enable practitioners to feel more personally connected to professionals and experts in their field (Lee & Chan, 2007). Thus, “communities of practice” can emerge around educational podcast usage, whereby knowledge sharing occurs between and among practitioners who share and discuss podcast content in the workplace and online (Wrather, 2016).

Although there is literature to support the use of educational podcasts, there appears to be a dearth of scholarly work focused on the use and impact of educational podcasts within the field of kinesiology (McNamara & Haegele, 2020). Understanding how the podcasting phenomena is impacting specific fields and professions is essential, as this medium has the ability to be used as a knowledge translation tool to reach a larger audience and increases the likelihood of the use of pertinent information within a particular field (Rader et al., 2014). For instance, because of lower levels of physical activity and increased obesity, new and effective modes of communication must be identified that can effectively inform sedentary populations about the merits of physical activity and health, as well as how to properly conduct physical activities and lead a healthy lifestyle. Turner-McGrievy and Tate (2011) explained that mobile technologies, including podcasts, may be an especially “useful conduit for delivery of a weight-loss program” (p. 2) due to the tremendous growth in the use of these technologies. Podcasting has the ability to be used not only within educational settings but also as a knowledge translation tool to influence various populations and disciplines within the field of kinesiology. Indeed, the potential for this tool, which has been deemed to be unique in its authenticity, accessibility, and ability to instill a community is largely still unknown (McNamara & Haegele, 2020; Kay, 2012; Lee & Chan, 2007; McNamara & Drew, 2019; Meserko, 2015; Wrather, 2016), especially within specific fields (e.g., kinesiology, health promotion) and disciplines (e.g., physical education, sport science).

Although research examining the application and impact on areas within kinesiology appears to be limited, preliminary research suggests it may be an effective learning tool. For example, McNamara et al. (2020) recently examined the effectiveness of three educational podcasts that were developed using adult learning theory and cognitive theory of multimedia principles (Mayer, 2011). The podcasts were developed to inform 29 special education administrators how to properly supervise and monitor adapted PE services for students with disabilities. Results showed a small, but significant, increase in test scores from pre- to posttest. Furthermore, the majority of the participants had positive perceptions toward the usefulness of the podcasts. This investigation suggests that educational podcasts may have some merit as a tool to disseminate information about the field of kinesiology to other key stakeholders. However, because of the limited amount of peer-reviewed literature dedicated to the use of educational podcasts within research and professions within the field of kinesiology (McNamara & Haegele, 2020), additional research and exploration on this topic are needed.

Purpose

Although the quantity of research focused on educational podcasts is increasing (e.g., Kay, 2012; Prakash, Muthuraman, & Anand, 2017; Wilson, Petticrew, & Booth, 2009), little is known about the impact and use of educational podcasts to disseminate information

with regard to kinesiology content (McNamara & Haegele, 2020). This is problematic, as O’Bannon, Lubke, Beard, and Britt (2011) explained that because educational podcasting research “is in its infancy, there is a need for additional research in different content areas and for longer periods of time” (p. 1891) in order to determine the long-term impact of this new tool. Scoping reviews are a particularly useful research methodology when the literature on a certain topic is broad and heterogeneous, as they allow for the wide ranging exploration of a specific topic (Arksey & O’Malley, 2005; Tricco et al., 2016). Scoping reviews enable researchers to chart the foundational concepts underpinning a broad research topic “and the main sources and types of evidence available” (Tricco et al., 2016, p. 2). Although similar to a systematic review, scoping reviews make it possible to present a comprehensive overview of the literature pertaining to a topic, irrespective of study quality, and are especially useful when examining scholarly areas that are emerging to clarify concepts and identify gaps within the literature (Peters et al., 2015; Tricco et al., 2016). Recently, scoping reviews have become more commonly used in response to a growing demand for summaries of the breadth of research around a particular topic (Goertzen, et al., 2015); this method of research has also been increasingly prevalent within the field of kinesiology (e.g., Aloraini et al., 2020; Goertzen, et al., 2015; Killian, Kinder, & Woods, 2019). The purpose of the current study was to conduct a scoping review of the literature in order to capture a comprehensive view of the peer-reviewed research, as well as the peer-reviewed practitioner writings on the use of educational podcasts in the field of kinesiology. In addition, this paper sought to identify any existing gaps in the literature. The following research questions guided this scoping review:

- (a) What research has been conducted that has examined the use of educational podcasts to disseminate information with regard to kinesiology content?
- (b) What scholarly practitioner articles exist related to the use of educational podcasts in the field of kinesiology?
- (c) What gaps exist within the literature related to educational podcasting and the field of kinesiology?

Method

The scoping review methodological framework proposed by Arksey and O’Malley (2005) and the Preferred Reporting Items for Systematic Reviews extension for Scoping Reviews Checklist (Tricco et al., 2018) guided this investigation. A recent scoping review focused on online and blended learning within the field of PE (Killian et al., 2019) was used to guide the development of the research questions and study selection process for the present scoping review. For this scoping review, podcasts were defined as a medium that delivers digital content through audio and visual mediums that can be distributed via the Internet to a variety of media devices such as smartphones and laptops (Hew, 2008). Although the definition of the field of kinesiology is contested (Reeve, 2007; Schary & Cardinal, 2016), for the purposes of this scoping review, kinesiology was defined as the study of human movement and physical activity (Reeve, 2007). This includes the production, dissemination, and application of kinesiology-related knowledge, within relevant professional contexts (e.g., physical educators, sport psychologists, physical therapists; Reeve, 2007). A broad definition of kinesiology was able to capture a comprehensive overview of research that has disseminated information related to the field of kinesiology.

Eligibility Criteria

The following inclusion criteria were used to identify relevant articles: (a) published between January 2003 and December 2019; (b) published in English language journals; (c) located in periodical publications (i.e., research articles and practitioner articles); (d) podcasts were included and discussed within the paper; (e) focused on a field within kinesiology (e.g., physical therapy, PE, exercise science). The year 2003 was starting point for the review as Berry (2015) noted that this year marked the conception of podcasts. For this study, peer-reviewed practitioner writing refers to peer-reviewed articles that are absent of methodology and raw data, and are given to support practitioners in a variety of ways including advising, establishing best practices, and noting trends.

Search Strategy

A university librarian conducted a search of the literature using the following databases: CINAHL, Communication & Mass Media Complete, Education Full Text, ERIC, PubMed, and SPORTDiscus. Search terms for all databases included a sophisticated search strategy that utilized Boolean Operators (i.e., and, or, not) and truncation (i.e., the use of the asterisk to retrieve various word endings). This search was conducted using different platforms (e.g., EBSCO, ProQuest) as each has their own unique searching capabilities and scope. To ensure a comprehensive search, the search term syntax used for this study included terms from either a podcast or a kinesiology category (podcast* OR vodcast* OR webcast* OR “streaming technology” OR “video casting” OR videocasting AND Kinesiology OR “physical education and training” OR “sport science” OR “exercise science” OR “movement science” OR “physical activity” OR “adapted physical activity” OR “sport psychology” or “sport management” OR “medical education” OR “community health”). This search term syntax was designed to cast the widest net possible, which led to the overidentification of citations.

Study Selection Process

According to Preferred Reporting Items for Systematic Reviews extension for Scoping Reviews Checklist, scoping reviews should utilize a data extraction process, which is commonly referred to as the data charting process (Killian et al., 2019; Peters et al., 2015; Tricco et al., 2018). First, each abstract, title, and authors' names of all articles collected within the database searches were inserted into a Google Sheets data charting file. Second, all duplicate articles were removed. Next, the articles were evaluated using a two-step process. The investigators first conducted independent title and abstract reviews of the identified articles to ensure they met inclusion criteria and were relevant to the review. After the title and abstract search, the investigators carefully reviewed each article to confirm that they met the full inclusion criteria. For both steps, at least two investigators independently evaluated all articles. In instances of disagreement, a third investigator who served as a tiebreaker reassessed articles. The interrater agreement between the investigators was calculated at 95%.

The data charting tool used in this study identified key characteristics of the included articles. Data were extracted from each article and entered into the appropriate form by the authors. Data extracted from research studies were organized according to the following items: (a) research design, (b) podcast features, (c) study research questions and/or purpose, (d) data collection

methods, (e) participant characteristics, and (f) key results. These items were selected to determine the extent to which specific characteristics were reported in the included articles. In addition, a basic numerical analysis with similar data categories as described previously was performed with the empirical research to illustrate trends and gaps within the literature (Arksey & O'Malley, 2005; Killian et al., 2019). Three of the investigators reviewed each of the included articles to confirm that the information for each item was accurate.

Results

A total of 802 articles were initially identified through the database searches and reference list searches. There were 464 duplicate articles that were excluded. Next, the investigators screened article titles and abstracts, which resulted in the exclusion of an additional 286 articles for failure to meet eligibility criteria. Next, the authors conducted full reviews of the remaining 52 articles, and an additional 38 articles were excluded. Once the review process was completed, 14 articles met the full eligibility criteria. Figure 1 provides an overview of the article identification process. Table 1 presents an overview of the research studies ($n = 11$), as well as a numerical analysis of the characteristics of the empirical articles identified are provided in Table 2.

Research Articles

Research Design

Of the 14 articles that met the inclusion criteria, 11 were data-driven research articles. Within these articles, a variety of research designs were implemented. Seven studies implemented an experimental/quasi-experimental design, with four of these employing experimental randomized control designs. Of the remaining four articles, one used a qualitative design, two used a mixed-methods design, and one used a Delphi method. All but one of the research studies focused on the impact of podcasts on either learning, motivation, or a physiological change (e.g., heart rate, weight loss). This outlier study used a Delphi method with a range of health professionals (e.g., occupational therapists, emergency medicine specialists) aimed to identify quality markers for blogs and podcasts within health-related fields (Lin et al., 2015).

Design and Implementation of Podcasts

The implementation of the podcasts in the identified research studies varied widely. Nine studies used investigator-created podcasts, and one study (Turner-McGrievy et al., 2009) compared investigator-created podcasts with a series of open-access podcasts. Three of these studies incorporated “vodcasts,” which are podcasts that utilize visuals (Abt & Barry, 2007; Hurst, 2016; McNeill & Fry, 2012). McNeill and Fry (2012) used video clips from course activities and used them as the foundation of the vodcasts. In addition, they compared the perceived usefulness of the vodcasts with audio podcasts.

Four studies identified the social cognitive theory (SCT; Bandura, 1991) as a theoretical framework that was used to develop the podcasts employed in these studies. All studies that used the SCT examined participant weight loss (Hales et al., 2017; Turner-McGrievy et al., 2009; Turner-McGrievy & Tate, 2011; Turner-McGrievy et al., 2017). Two studies (Hurst, 2016; McNeill & Fry, 2012) related their findings to learning theories. The remaining

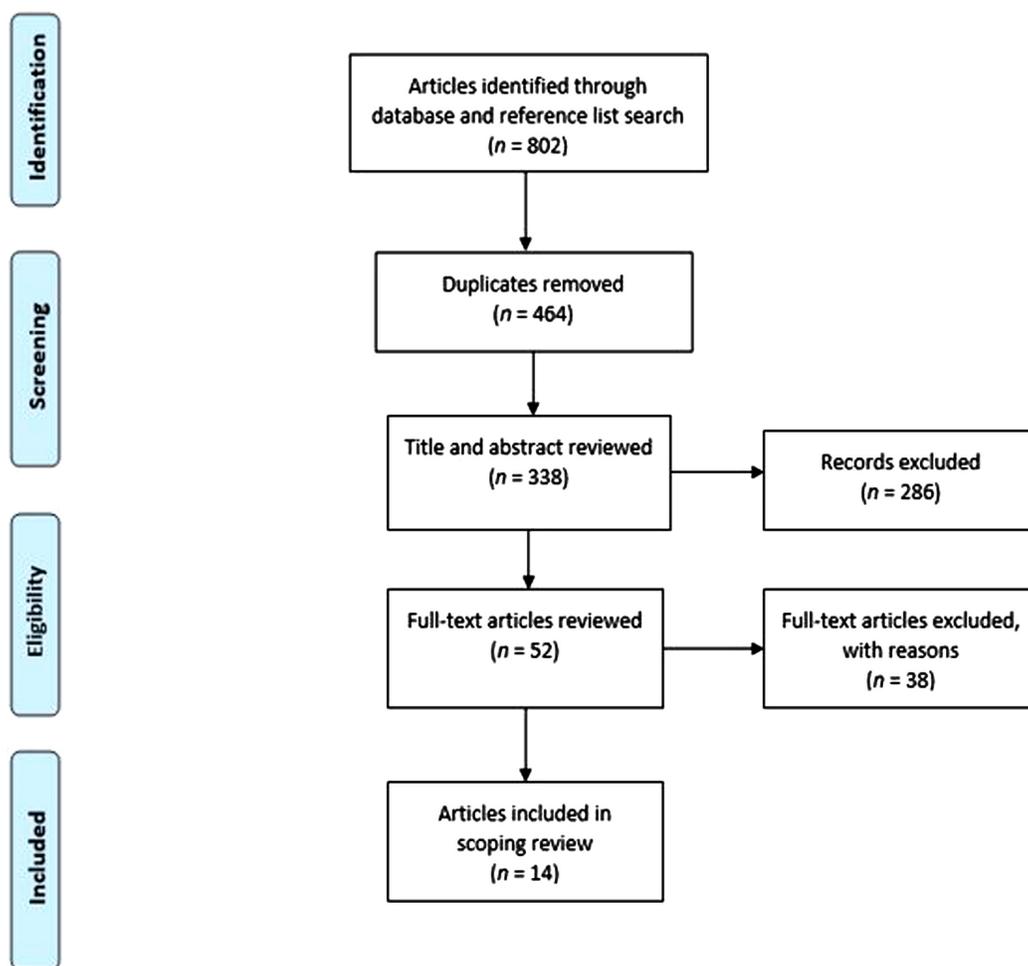


Figure 1 — PRISMA flow diagram of scoping review search.

studies had no reference to specific theories in relation to podcast development or their findings (Abt & Barry, 2007; Lin et al., 2015; McNeill, Mukherjee, & Singh, 2010; Rockhill, Pastore, & Johnston, 2019; Stork, Karageorghis, & Ginis, 2019). Five studies addressed the design and development of the podcast(s) incorporated within the studies (McNeill et al., 2010; McNeill & Fry, 2012; Turner-McGrievy et al., 2009; Turner-McGrievy & Tate, 2011).

Two of the studies utilized podcasts as a supplementary component of their studies (Hales et al., 2017; Turner-McGrievy et al., 2017). For example, Hales and colleagues (2017) examined the predictors of weight loss and points earned on a weight loss application in obese and overweight adults. Although informational podcasts were delivered to participants twice a week throughout the duration of the study, this was given to both the control group and experimental group, and thus was not the main intervention. The eight remaining quantitative, qualitative, and mixed-methods studies used podcasts as a primary tool within their investigations (Abt & Barry, 2007; Hurst, 2016; McNeill et al., 2010; McNeill & Fry, 2012; Rockhill et al., 2019; Stork et al., 2019; Turner-McGrievy et al., 2009; Turner-McGrievy & Tate, 2011). However, within Stork and colleagues' (2019) study, podcasts, as well as no audio, were used as a control in order to examine the effectiveness of motivational music on psychological and physiological responses to an exercise protocol.

Participants

Sample sizes ranged from 16 to 96 participants. Overall, the included studies had 552 total participants. Five studies examined undergraduate or postgraduate students in kinesiology-related courses. This included students enrolled in PE courses (McNeill et al., 2010; McNeill & Fry, 2012), exercise physiology courses (Abt & Barry, 2007), physiotherapy courses (Hurst, 2016), and sports management courses (Rockhill et al., 2019). Five studies focused on overweight or obese participants (Hales et al., 2017; Stork et al., 2019; Turner-McGrievy et al., 2009; Turner-McGrievy & Tate, 2011; Turner-McGrievy et al., 2017), and one study surveyed health profession educators, which included occupational therapists (Lin et al., 2015).

Data Collection and Outcomes

Outcome measures for the included studies focused largely on weight loss and the listeners' perceptions toward the usefulness of the podcasts. Of the five studies that focused on weight loss, each collected information related to body mass index, weight, amount and level of physical activity, and food consumption. Other data collected included personality characteristics (Hales et al., 2017; Turner-McGrievy et al., 2009), eating behaviors (Turner-McGrievy & Tate, 2011), points earned on a weight loss application (Hales et al., 2017), self-efficacy (Turner-McGrievy & Tate,

Table 1 Overview of Reviewed Studies Using Podcasts

Author (year)	Study design	Podcast design	Purpose	Data collection	Participants	Key results
Abt and Barry (2007)	Participants were randomly assigned to either an exp or control group. The exp group received the vodcasts, and the control group was provided with an exact transcript of the vodcasts in printed form. The duration of the study was 6 weeks.	Six vodcasts were recorded in a "radio" style format incorporating a question and answer discussion between the authors. They used jingles, music, section breaks, and images. Podcasts ranged in length from 5 to 14 min. Each vodcast related to muscles systems taught in the course.	To assess the effect of podcasts on exam performance.	Pre- and posttest, 32 multiple-choice questions pertaining to the materials covered in the vodcasts.	Fifty first-year undergraduate exercise physiology students. Twenty-three students were in the exp group and 27 students were in the control group.	Both groups significantly improved their exam scores. The differences between the groups were insignificant. The exp group improved their exam score by 46%, whereas the control group improved their score by 43%.
Hales et al. (2017)	Participants were randomly divided into an exp group receiving a weight loss tracking and information app with the ability to earn points for PA, or a comparison group that was given a weight loss tracking and information app without the ability to earn points. The duration of the study was 12 weeks.	Participants received two vodcasts per week for 12 weeks. Podcasts were developed using SCT constructs and focused on nutrition and PA topics.	To examine predictors of weight loss and points earned through the use of a weight loss app.	Personality characteristics (i.e., extraversion, openness, agreeableness, and conscientious), weight measurements, and points earned from the app were tracked.	Fifty-one overweight and obese adults with android smartphones/tablets. Twenty-six participants were in the exp group, and 25 were in the comparison group.	The total number of points earned by participants decreased over time. Two variables significantly predicted weight loss, these included total points earned ($p = .01$) and higher conscientiousness ($p = .01$).
Hurst (2016)	Vodcasts were used to help students with skill and content acquisition in a physiotherapy college course. Vodcasts were accessed outside of class, in class, and during self-study lab session.	Vodcasts were approximately 7 min in length. They consisted of an initial theoretical commentary followed by a patient demonstration.	To explore students' experiences of using vodcasts in the physiotherapy curriculum to develop the learning of clinical skills.	Four separate focus groups with 6–9 students.	Thirty-one undergraduate ($n = 16$) and postgraduate ($n = 15$) physiotherapy students.	Seven themes emerged from the qualitative analysis as follows: (a) revision, (b) developing a step-by-step process, (c) repetition, (d) refinement of skills, (e) confirmation/comparison, (f) authenticity/quality, and (g) placement benefits. Overall, students valued the versatility and audio–visual nature of the vodcasts, and they perceived them to be helpful in reviewing for exams and class.
Lin et al. (2015)	Participants completed two surveys in a 2-hr session while attending a professional conference. The first survey identified 151 quality indicators that participants rated on a Likert scale. The results of the first survey were compiled and used to develop the second survey. The second survey asked participants if they agreed with the inclusion of the quality indicator by selecting include or do not include.	Not applicable	To identify quality indicators for blogs and podcasts in the health profession.	Two sequential surveys in a modified Delphi consensus process.	Forty-four health professions educators at a conference. Occupational therapists were among the group of health profession educators.	Thirteen quality indicators were identified and classified into the domains of credibility, content, and design. Nine of these indicators applied to blogs and podcasts, with functionality as an additional quality indicator specific to podcasts.

(continued)

Table 1 (continued)

Author (year)	Study design	Podcast design	Purpose	Data collection	Participants	Key results
McNeill and Fry (2012)	Students in a course focused on the principles of games were given podcasts and vodcasts throughout the duration of a 12-week course that met twice a week. Podcasts and vodcasts were used to supplement and teach students about various topics in the course. Other instructional tools, such as PowerPoint, were used within this study.	Vodcasts and podcasts were assigned for each topic assigned in the course. There were 21 podcasts and 47 vodcasts in all. The podcasts discussed a topic and its pedagogical underpinning. Vodcasts were created from video clips from class activities and highlighted set-up, actions, and outcomes of various pedagogical initiatives.	To assess and compare the use of podcasts and vodcasts within a PETE college course.	A survey, field notes, focus groups, e-mail and instant messenger reflective prompts, and e-portfolio reflections were used to assess the student's perceptions toward the usefulness of the podcasts and vodcasts.	Thirty-one postgraduate PETE students in Singapore.	Overall, the students reported that they enjoyed the blended course. Overall, the students rated podcasts ($M = 3.2$) lower than vodcasts ($M = 3.8$). When asked which of these mediums was more valuable, almost three quarters indicated vodcasts. From the focus groups, the students were quite positive about the vodcasts; however, it was noted that students would have liked to generate their own vodcasts.
McNeill et al. (2010)	Students were equally divided into an exp group and a control group. Each group had a different teacher, but both teachers had taught this course together previously and used the same course outline, sequence, materials, and resources. The exp group received podcasts twice a week that covered materials from the previous class. The duration of this study was 12 weeks.	Podcasts were generated using a script of the salient pedagogical features that were implemented, discussed, or alluded to in class. The script consisted of commentary based on the teacher's observations of individual as well as group performance. Issues, anomalies, and questions that arose in the post-lesson debrief were also included in the podcast. The podcasts ranged in length from 4 to 7 min.	To assess how the use of podcasts can impact and enhance the pedagogical experience of face-to-face classes.	Survey and focus groups on their perceptions of the podcasts as a learning tool. The survey included Likert scale questions pertaining to their perceptions toward their overall grades, test scores, and assignments.	Forty first-year PE students in a post-graduate program.	Sixty percentage of the participants reported listening to each podcast. The Likert scale question pertaining to their perceptions toward their assignment scores was rated as significantly higher in the exp group when compared with the control group ($p = .011$). No significant differences were found between the groups and the other survey questions. From the focus group interviews, podcasts were reported as being helpful for a diverse group of learners and contributed significantly to their understanding of the content.
Rockhill et al. (2019)	Students in a course focused on sports and facilities management were given podcasts throughout the duration of the course. Podcasts were used to reinforce content learned within the course.	Six podcasts were created by the instructor and used as a supplemental tool. Topics included decision making, event staffing, facility scheduling, inclement weather, swim meet, and weightlifting. Each podcast presented an event management scenario and posed questions.	To explore the use of podcasts in a sports management course and to determine the effectiveness of these podcasts on enhancing student learning.	Survey assessed students' perceptions toward podcasts impact on their learning, motivation to listen to podcasts, and usefulness of the podcasts.	Sixteen graduate students enrolled in an event and facilities management course.	Participants had positive views toward their learning experience from listening to the podcasts. Students had low to moderate motivations to listen to the podcasts and that the use of podcasts did not increase motivation to engage in class discussions or explore topic further on own. Participants had generally favorable views toward the podcasts (e.g., easy to access, good length, more effective than textbooks).

(continued)

Table 1 (continued)

Author (year)	Study design	Podcast design	Purpose	Data collection	Participants	Key results
Stork et al. (2019)	Each participant completed three exercise trials over a 2- to 3-week period. Each exercise trial followed the same routines and given under three conditions: motivational music, podcast, and no audio.	For the music and podcast conditions, audio played from a stereo for the duration of workout. The podcast focused on the history of consumerism and was devoid of music. It was 7 min in length.	To compare psychological and physiological responses to a low-volume exercise protocol under three conditions.	HR, perceived exertion, and power output were recorded throughout the conditions. In addition, a survey assessed affective valence, affective arousal, and exercise enjoyment.	Twenty-four inactive adults.	Postexercise enjoyment and affective variables were significantly greater in the music condition compared with podcast ($p = .04$) and no-audio conditions ($p = .04$). HR responses and peak power output were significantly higher in the music condition in comparison to the podcast ($p = .02$, $p = .02$) and no-audio conditions ($p = .03$, $p = .01$). Affective responses were significantly more positive in the music condition compared with the no-audio control ($p = .03$), however, nonsignificant compared to the podcast control ($p = .11$).
Turner-McGrievy et al. (2009)	Participants were randomly assigned to a control group that received an open-access weight loss podcast or an exp group that received a theory-based weight loss podcast designed by the researchers. The duration of this study was 12 weeks.	Participants received two podcasts per week. Podcasts were developed using SCT constructs and focused on nutrition and PA topics. The podcasts ranged in duration from 7 to 31 min.	To examine the impact of a weight loss podcast designed with the SCT when compared with a nontheory-based weight loss podcast.	Questionnaires assessed knowledge of weight loss topics, food intake, PA, user control, cognitive load, and SCT constructs. Weight and BMI were also measured.	Eighty-eight overweight and obese adults who owned a digital music player and with stable medical status. Forty-one participants were in the exp group and 37 were in the comparison group.	Participants in the exp group had a significantly greater decrease in weight ($p < .001$) and BMI ($p < .001$) when compared with the control group. The exp group reported greater increases vigorous PA ($p < .01$), and in fruit ($p < .05$) and vegetable ($p < .05$) intake compared with the control group. The exp group also had greater scores in relation to weight loss-related knowledge ($p < .05$), elaboration ($p < .001$), user control ($p < .001$), and less cognitive load ($p < .001$). There was no change in high fat-food intake, moderate PA, walking, or sedentary behaviors between groups.
Turner-McGrievy et al. (2017)	Participants were randomly assigned an App group where they would use a diet-monitoring app or a wearable bite counter device. Participants in both groups received two podcasts per week for 6 months.	Podcasts were developed using SCT constructs and focused on nutrition and PA topics.	To examine the impact of different mobile self-monitoring methods in addition to weight loss podcasts on weight loss.	Questionnaires assessed 24-hr dietary intake recalls and PA. A diet-monitoring app tracked daily energy intake in the App group and a wearable bite counter device counted eating activity in the Bite group. Both groups used pedometers to track steps. Weight and height were also measured. Data were collected at baseline, 3 months, and 6 months.	Eighty-one overweight and obese adults interested in losing weight and owned a smartphone. Thirty-nine participants were in the Bite group and 42 were in the App group.	Weight loss was significantly higher in the App group ($p < .001$). There were no significant differences between groups in changes in energy intake or days diet was tracked. PA metabolic equivalents were significantly higher in the Bite group ($p = .02$). Significant correlations were found between total weight loss and number of podcasts downloaded ($p < .01$) and days diet was tracked ($p < .01$).

(continued)

Table 1 (continued)

Author (year)	Study design	Podcast design	Purpose	Data collection	Participants	Key results
Turner-McGrivoy and Tate (2011)	Participants were randomly assigned to receive either a podcast only or a podcast in addition to enhanced mobile media. All participants received two podcasts per week for 3 months and two shorter podcasts per week for the following 3 months. Participants in the podcast and enhanced mobile media also used a diet and PA monitoring app, and received two messages per day from the researchers on social media.	Podcasts were developed using SCT constructs and focused on nutrition and PA topics, anecdotal accounts, and goal-setting activities. The podcasts ranged in duration from 5 to 15 min each.	To examine the impact of mobile support communication and mobile diet monitoring on weight loss in addition to using a weight loss podcast designed with the SCT.	Questionnaires assessed 24-hr dietary intake recall, PA, self-efficacy, eating behaviors, and perceived feelings of support during intervention. Weight, height, and BMI were also measured.	Ninety-six overweight and obese adults with body weight scales and iPhone, iPod Touch, BlackBerry, or android smartphones with Internet access. Forty-nine participants were in the podcast-only group and 47 were in the podcast and mobile media group.	Six-month weight loss did not differ between groups. Podcast downloads over 6 months was significantly correlated with weight loss in both groups ($p < .001$). Days per week of reported diet monitoring did not differ between groups; however, the podcast and mobile group were significantly more likely to use an app to monitor diet ($p = .01$). There were more downloads per episode in the podcast and mobile group ($p < .001$). The podcast and mobile group felt significantly more user control at 3 months than the podcast-only group ($p = .02$), but not at 6 months. More podcast-only participants relied on friends ($p = .045$) for support, whereas the podcast and mobile participants relied more on online sources ($p = .001$).

Note. App = application; BMI = body mass index; exp = experimental; HR = heart rate; PA = physical activity; PE = physical education; PETE = PE teacher education; SCT = social cognitive theory; vodcast = video podcast.

Table 2 Numerical Analysis of the Research Articles

	1	2	3	4	5	6	7	8	9	10	11
Research design											
Experimental/quasi-experimental	×	×					×	×	×	×	×
Qualitative			×								
Mixed method					×	×					
Delphi method				×							
Area(s) examined											
Learning	×		×		×	×	×		×		
Motivation					×		×	×			
Physiological change		×						×	×	×	×
Participants											
Obese/sedentary		×						×	×	×	×
College students	×		×		×	×	×				
Health profession educators				×							
Podcast type(s)											
Investigator created	×	×	×	×	×	×	×			×	×
Open access								×	×		
Vodcasts	×		×		×						
Theory used											
SCT		×							×	×	×
CTML			×								
CTL					×						
None	×			×		×	×	×			
Primary data collected											
Knowledge test	×								×		
Survey		×		×	×	×	×	×	×	×	
Focus groups			×		×	×					
Weight loss points		×							×	×	×
BMI									×	×	×
Heart rate								×			

Note. 1 = Abt & Barry (2007); 2 = Hales et al. (2017); 3 = Hurst (2016); 4 = Lin et al. (2015); 5 = McNeill & Fry (2012); 6 = McNeill et al. (2010); 7 = Rockhill et al. (2019); 8 = Stork et al. (2019); 9 = Turner-McGrievy et al. (2009); 10 = Turner-McGrievy & Tate (2011); 11 = Turner-McGrievy et al. (2017); CTL = constructivist learning theory; CTML = cognitive theory of multimedia learning; SCT = social cognitive theory; BMI = body mass index.

2011), and knowledge tests via the podcasts (Turner-McGrievy et al., 2009; Turner-McGrievy & Tate, 2011). Stork and colleagues (2019) collected other forms of physiological data, which included heart rate and power output during an exercise protocol.

Within the weight loss studies, it appears that these were extensions of one another. Turner-McGrievy and colleagues (2009) first examined the impact of podcasts on knowledge and weight loss between a group that received podcasts grounded within the SCT (Bandura, 1991) and another group that received open-access podcasts. Participants who were provided the theory-driven podcasts significantly outperformed the open-access podcast group on several measures, such as weight loss, amount of physical activity, and knowledge scores. Next, Turner-McGrievy and Tate (2011) examined the difference between participants who received a podcast intervention and a group that received a podcast and a mobile device intervention. Both of these podcasts were developed using the SCT. There was no significant difference in weight loss. The two more recent studies have incorporated the podcasts as a supplementary or supporting component of the intervention (Hales et al., 2017; Turner-McGrievy et al., 2017). Furthermore, within these more recent studies, there is no explicit podcast development

section; rather there is just a reference to the podcast development protocol from the 2009 and 2011 studies (Turner-McGrievy et al., 2009; Turner-McGrievy & Tate, 2011). All four weight loss studies resulted in significant weight loss due to the use of an intervention that utilized podcasts. However, it should be reemphasized that two of these studies used podcasts as a supplementary tool (Hales et al., 2017; Turner-McGrievy et al., 2017). Thus, when reviewing the results of the weight loss studies, it may be generalized that the use of podcasting of weight loss information, in accompaniment of other online interventions (e.g., weight loss applications) enhances obese and overweight individuals' ability to lose weight.

Five research studies examined how college kinesiology students are impacted by and perceive podcasts as an educational tool (Abt & Barry, 2007; Hurst, 2016; McNeill et al., 2010; McNeill & Fry, 2012; Rockhill et al., 2019). Of the studies that occurred within college settings, only the study conducted by Abt and Barry (2007) used podcasts as a typical intervention within their study, with the other studies simply embedding the podcasts within their classes and examining their impact on students. More specifically, Abt and Barry (2007) used a pretest/posttest design to measure knowledge gained from the use of podcasts. In this study,

the experimental group received podcasts while the intervention group received transcripts of the podcasts. This study found that both groups improved significantly in their test scores, but there was no significant difference between groups. From the focus groups, participants expressed that the podcasts were flexible and helpful for a diverse group of learners, and they contributed significantly to their understanding of the content. For example, one participant stated, “I liked being able to constantly look back, rewind it, and replay it whenever I wanted to. This is good for any kind of learner” (Hurst, 2016, p. 208). This was reiterated for vodcasts by one participant explaining “they are awesome” (McNeill & Fry, 2012). McNeill and colleagues (2010) also employed a survey to measure the students’ perceptions toward the usefulness of the podcasts in relation to their grades. When asked if the podcasts were helpful, 15% responded with “ok,” 50% with “very helpful,” and 40% as “exceptionally helpful.” The most popular responses from open-ended questions about the usefulness of the podcasts consisted of the aspect of consolidation, reiteration, and reinforcement of the content. In addition, there were no identified significant differences between the two groups in their perceptions toward their overall grades or test scores; however, the podcast group did have significantly higher perceptions toward their assignment grades. Overall, these results suggest that kinesiology students perceive educational podcasts as a flexible, accessible, and beneficial tool to their learning; however, there is little quantitative evidence to directly show any substantial impact of podcasts on their learning.

Lin and colleagues (2015) implemented a modified Delphi method with 44 health profession educators, which included occupational therapists, to come to a consensus on quality indicators for both blogs and podcasts. Thirteen quality indicators that classified into the domains of credibility ($n=8$), content ($n=4$), and design ($n=1$) met the inclusion threshold. Nine of these indicators applied to both blogs and podcasts, with an additional three indicators specific to blogs and one specific to podcasts. Examples of the indicators that were specific to both blogs and podcasts include “Do the authorities (e.g., author, editor, and publisher) that created the resource list their conflicts of interest?” (Credibility) and “Is the content of this educational resource of good quality?” (Content). The design indicator was only applicable to podcasts. This indicator reinforced the importance of functionality of podcasts for all learners. The podcast design indicator was “Does the resource employ technologies that are universally available to allow learners with standard equipment and software access?” The authors concluded that “by identifying the quality indicators most important to health professions educators, this modified Delphi study provides 13 quality indicators that may help develop standards, guide development, and improve identification of high-quality medical education blogs and podcasts” (p. 549).

Practitioner Articles

Three practitioner articles qualified for inclusion in the scoping review (McNamara & Brooks, 2016; Mears, 2009; Shumack & Reilly, 2011). Each of these articles was quite similar in several aspects. Each focused on using podcasts within a PE setting and were published within PE practitioner journals (1 = *Strategies: A Journal for Physical and Sport Educators*, 2 = *Journal of Physical Education, Recreation and Dance*). In addition, each article described the beneficial use of podcasts within a PE setting, as well as each provided a systematic outline on how to create podcasts and listed the equipment needed to properly record

podcasts. Shumack and Reilly (2011) focused solely on vodcasts, whereas the other two articles focused on both audio and video podcasts (McNamara & Brooks, 2016; Mears, 2009). In addition, McNamara and Brooks (2016) listed available open-access podcasts that focus on PE topics.

Discussion

The purpose of the current study was to conduct a scoping review of the literature in order to capture a comprehensive view of the peer-reviewed research, as well as the peer-reviewed practitioner writings on the use of educational podcasts in the field of kinesiology. Fourteen articles were identified and evaluated. Based on the findings of this scoping review, it appears that most of the literature reports positive overall findings concerning the use of educational podcasts within the field of kinesiology. Another major finding from this scoping review is that there is a general lack of peer-reviewed literature that has examined educational podcasts within the field of kinesiology. This finding displays a divergence between the literature and the field. Other fields, especially within the medical field, have had a much greater presence of educational podcasting literature (e.g., Prakash et al., 2017; Wilson et al., 2009). In fact, three articles identified within this scoping review were published within medical journals (Lin et al., 2015; Turner-McGrievy et al., 2009; Turner-McGrievy & Tate, 2011). Several studies in the medical education literature have utilized podcasts for a variety of purposes. For example, Prakash and colleagues (2017) explained that podcasts are an efficient teaching method, even in comparison to other modes of learning, such as traditional face-to-face teaching or text-based learning. Researchers and practitioners within the field of kinesiology should consider engaging with discipline-specific podcasts, producing their own podcasts, or collaborating with existing podcast producers to further disseminate their research findings and best practices. Some journals now host their own podcast, which include discussions and summaries of content published in the journal, as well as discussion on current and contemporary topics. Journals extending their media platforms include *British Journal of Sports Medicine* and the *Clinical Journal of Sport Medicine*. PD organizations and educational institutions may also find it worthwhile to consider developing their own podcasts to deliver esoteric knowledge to their communities and help to provide kinesiology professions with ongoing content. This will provide an opportunity for researchers and practitioners to disseminate knowledge in a way that is engaging for both professional and college audiences, as well as meet the need for flexibility and availability in a busy and drastically changing world.

Although this scoping review provides a comprehensive overview of the evidence and research trends, the heterogeneity of the studies and limited literature on this topic make it difficult to form any substantial conclusions. However, the simple recognition of this gap in the literature may be important to the field of kinesiology, as it may allow for more concerted efforts to examine and document the value of this medium. In an attempt to have more concentrated endeavors to examine the impact of educational podcasting within the field of kinesiology, certain aspects from this scoping review should be recognized. For one, all of the literature was focused either on participants receiving a physical activity intervention or on college students. However, research on practitioners within the field of kinesiology (e.g., physical educators, coaches, physical therapists) was

entirely missing from this review. This is concerning, as educational podcasts have been identified to be a valuable tool for continuing PD (Healy et al., 2020; Kennedy et al., 2017). In addition, for practitioners within the field of kinesiology, podcasts may be an especially advantageous learning tool, as this group has often cited financial and time constraints to attending formal PD (York et al., 2014).

However, it should be noted that one recently published study examined the use of educational podcasts with in-service physical educators (Healy et al., 2020). This study was excluded from the current scoping review as it was not indexed within the databases during the timeframe from which this scoping review search occurred. For this study, Healy and colleagues (2020) conducted a quasi-experimental study to determine the effectiveness of online training for physical educators. The asynchronous (i.e., self-paced) online PD was developed using adult learning theory and cognitive theory of multimedia principles (Mayer, 2011). The online PD consisted of video podcasts, sought to teach physical educators how to properly implement peer tutoring in order to better include students with disabilities within a PE setting. Results showed the experimental group that used educational podcasts had significantly higher posttest scores on how to properly implement peer tutoring compared with the waitlist control group. Furthermore, the majority of the participants in the experimental group had positive perceptions toward the online setting for receiving education. This investigation suggests that educational podcasts can be an effective learning tool for practitioners within the field of kinesiology. Research such as this is essential, as it suggests that educational podcasts can be an effective learning tool for practitioners within the field of kinesiology. This may provide insight on using educational podcasts as a tool in the future to provide both college students and practitioners within the field of kinesiology the opportunity to easily access quality PD through mediums outside of traditional face-to-face PD, which has been cited to have significant barriers to regularly attending (York et al., 2014).

More studies should explicitly discuss the development and design process of the podcasts utilized within their studies, as many of the studies within this review failed to explicitly state this process and the content within the podcasts. For example, several of the articles reviewed had no mention of whether the podcasts used were designed by the investigators or were pre-existing open-access podcasts. The absence of this information prohibits future researchers from using similar methodologies in developing high-quality podcasts. The lack of overall depth of research protocols prevalent throughout many of the studies identified within the present review. These findings are consistent with Kay (2012) who argued that it is crucial to confront these “significant methodological concerns in order to establish the reliability and validity of results, compare and contrast results from different studies, and address some of the more difficult questions such as under what conditions and with whom” (p. 826) podcasts are most useful. This absence of methodological reliability and validity is especially problematic as it can lead to a lack of confidence in the results.

Aside from the weight loss-focused studies (e.g., Turner-McGrievy et al., 2009), the studies identified within the scoping review did not appear to adhere to any specific theoretical frameworks to guide the design of the podcasts. Other educational podcast researchers in related areas have also raised this concern (Hew, 2008; Mayer, 2011; McNamara et al., 2020). Another concern is that the majority of educational podcast studies are action-based research studies that mostly lack any discussion of

theoretical frameworks (Drew, 2017; Hew, 2008; McNamara & Drew, 2019; McNamara et al., 2020). This also aligns with a great deal of the research identified within this review (e.g., McNeill et al., 2010; McNeill & Fry, 2012). In addition, other than the studies that focused primarily on weight loss, most of the identified studies examined participants’ enjoyment and engagement with regard to podcasting rather than focusing on understanding how learning is occurring. McNamara and Drew (2019) recently stated this is problematic, as “although it is important to measure participants’ enjoyment and motivations while listening to podcasts for learning purposes, it is crucial that researchers also begin to examine the cognitive learning outcomes associated with listening to educational podcasts” (p. 5). Hence, research explicitly focused on cognitive learning outcomes is warranted in order to gain a comprehensive understanding of the impact of podcasts used for PD or within college courses.

It is noteworthy that the same scholar (i.e., Turner-McGrievy) was a key contributor in four of the 11 data-driven articles identified. This author, along with other authors, appears to be continuing a line of inquiry that exemplifies the significance impact educational podcasts can have to inform and motivate overweight and obese people. This series of studies has led to refined podcast development and implementation sections that would enable practitioners and researchers alike to better replicate these studies for their own purposes. In addition, many of these studies were paired with a mobile application used to track weight loss. Due to the large increases in obesity across the United States, it is essential that an array of effective modes is identified that can effectively inform sedentary populations about the merits of physical activity and health, as well as how to properly conduct physical activities and lead a healthy lifestyle. It appears that Turner-McGrievy and colleagues have begun a strong research line that is able to create a more comprehensive understanding of how the podcasting phenomena, along with mobile devices, might be employed as a knowledge translation tool to affect overweight and obese populations seeking to lose weight. Scholars should strive to conduct studies that progress off one another to discern how the podcasting phenomena can be employed as a knowledge translation tool to influence various populations and disciplines within the field of kinesiology.

Limitations

The limitations to this scoping review should be acknowledged. First, scoping reviews are limited in that their “focus is to provide breadth rather than depth of information in a particular topic. As such, the conduct of a meta-analysis is generally not conducted in a scoping review” (Tricco et al., 2016, p. 9). Thus, it is difficult to make any widespread generalizations from this review. Second, like most scoping and systematic reviews, this investigation was limited by the inclusion criteria. For example, this review only included studies disseminated in English, due to the large amount of studies initially screened and the investigators’ language limitations. Third, the definition of the field of kinesiology used to help guide this investigation should also be noted as a limitation of this study. As noted previously, simply defining the field of kinesiology is controversial, as this is multidisciplinary field that often conducts interdisciplinary research (Reeves, 2007; Schary & Cardinal, 2016). Therefore, because of the broad scope and multidisciplinary nature of kinesiology, it is difficult to conduct a full review of the relevant articles within each field that falls within kinesiology.

Conclusions

The low cost, ease of production, and rapid distribution associated with educational podcasts has made it an increasingly prevalent instructional tool (Kay, 2012; McNamara et al., 2020; Wilson et al., 2009). However, research within the area of educational podcasting in the field of kinesiology appears to be in its infancy. Although this scoping review may be an important starting point in developing this area of literature, it is critical that future researchers report all of the information critical to their research design, instrument development, and findings. For example, future researchers should examine the use of various theoretical frameworks used within the development of specific types of podcasts (e.g., short-duration podcasts, narrative podcasts; McNamara et al., 2020). Future researchers should also explicitly examine the impact and perceived usefulness of educational podcasts with different populations within the field of kinesiology (e.g., in-service practitioners, undergraduate kinesiology students). Even simple descriptive research would be beneficial, as it would allow for an understanding of the extent to which these groups are using this medium to fulfill their PD and learning needs.

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