

An international, interprofessional investigation of the self-reported podcast listening habits of emergency clinicians: A METRIQ Study

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CLINICIAN'S CAPSULE

What is known about the topic?

Podcasts are used broadly by emergency clinicians for education.

What did this study ask?

How and why podcasts are used by emergency medicine and critical care clinicians?

What did this study find?

Participants most frequently listened to medical podcasts to review new literature, learn core material, and refresh memory; few utilize active learning strategies, and most conduct other activities while listening.

Why does it matter to clinicians?

Learners may consider utilizing active learning techniques while listening to podcasts; podcast producers may encourage the use of active learning techniques.

Methods: An international interprofessional sample (medical students, residents, physicians, nurses, physician assistants, and paramedics) was recruited through direct contact and a multimodal social media (Twitter and Facebook) campaign. Each participant completed a survey outlining how and why they utilize medical podcasts. Recruitment materials included an infographic and study website.

Results: 390 participants from 33 countries and 4 professions (medicine, nursing, paramedicine, physician assistant) completed the survey. Participants most frequently listened to medical podcasts to review new literature (75.8%), learn core material (75.1%), and refresh memory (71.8%). The majority (62.6%) were aware of the ability to listen at increased speeds, but most (76.9%) listened at 1.0 x (normal) speed. All but 25 (6.4%) participants concurrently performed other tasks while listening. Driving (72.3%), exercising (39.7%), and completing chores (39.2%) were the most common. A minority of participants used active learning techniques such as pausing, rewinding, and replaying segments of the podcast. Very few listened to podcasts multiple times.

Conclusions: An international cohort of emergency clinicians use medical podcasts predominantly for learning. Their listening habits (rarely employing active learning strategies and frequently performing concurrent tasks) may not support this goal. Further exploration of the impact of these activities on learning from podcasts is warranted.

ABSTRACT

Objectives: Podcasts are increasingly being used for medical education. A deeper understanding of usage patterns would inform both producers and researchers of medical podcasts. We aimed to determine how and why podcasts are used by emergency medicine and critical care clinicians.

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RÉSUMÉ

Objectif: Le recours à la baladodiffusion est de plus en plus fréquent en formation médicale. Une meilleure compréhension des habitudes d'utilisation des balados éclairerait les producteurs de contenu médical et les chercheurs. L'étude visait donc à déterminer comment et pourquoi la baladodiffusion est utilisée par les praticiens de la médecine d'urgence et de la médecine intensive.

Méthode: L'équipe a fait appel aux relations personnelles directes et à une stratégie multimodale de recherche dans les médias sociaux (Twitter et Facebook) pour former un échantillon international et interprofessionnel (étudiants en médecine, résidents, médecins, infirmiers, adjoints aux médecins et ambulanciers paramédicaux) de participants. Chacun devait remplir un questionnaire en ligne sur la manière dont il utilisait les balados en médecine et les raisons pour lesquelles il employait cette méthode. Le matériel servant à la recherche de participants comprenait un site web sur l'étude et un document infographique.

Résultats: Au total, 390 participants, provenant de 33 pays et pratiquant dans 4 professions (médecine, soins infirmiers, paramédecine, médecine auxiliaire), ont rempli le questionnaire. Le plus souvent, les répondants écoutaient du contenu

médical en baladodiffusion pour repasser de la nouvelle documentation (75,8%), pour apprendre du contenu de base (75,1%) et pour se rafraîchir la mémoire (71,8%). La majorité des participants (62,6%) connaissaient les possibilités d'écoute en accéléré, mais la plupart (76,9%) préféraient l'écoute à vitesse normale (1,0 x). Tous, à l'exception de 25 répondants (6,4%), faisaient autre chose pendant qu'ils écoutaient les fichiers, notamment conduire (72,3%), faire de l'activité physique (39,7%) ou effectuer des tâches ménagères (39,2%). Une minorité de participants appliquaient toutefois des techniques d'écoute active, telles que pauses, retours rapides ou réécoute, à des fins d'apprentissage. Très peu écoutaient à plusieurs reprises du contenu baladodiffusé.

Conclusions: Il ressort de l'enquête menée dans la cohorte internationale que les praticiens des soins d'urgence utilisent principalement les balados à des fins d'apprentissage. Toutefois, leurs habitudes d'écoute (peu d'écoute active et beaucoup de tâches concomitantes) peuvent ne pas favoriser l'atteinte du but visé. Aussi serait-il justifié d'examiner l'incidence des activités concurrentes sur l'apprentissage par baladodiffusion.

Keywords: Education, emergency medicine, research

INTRODUCTION

Educational podcasts have become popular platforms for teaching and learning in medical education^{1,2} and are one of the most-utilized educational resource among emergency medicine residents.^{3,4} However, it is unclear how they are used or if they could be used most effectively for learning. The educational literature provides broad support for the superiority of active learning.⁵ The inherently passive nature of podcasts may limit their effectiveness.⁶ Few studies have explored nuanced listening behaviours such as whether listeners use active learning methods such as note-taking, pausing, or repeating segments for processing.^{7,8} Given the scant work done to characterize the use of podcasts by a broader group of practicing clinicians and the uncertainty around the active use of podcasts, we sought to characterize usage patterns and listening behaviours of an international cohort of emergency medicine and critical care clinicians.

METHODS

We performed a cross-sectional survey to determine how podcasts are used by emergency and critical care

clinicians recruited through a multimodal online sampling strategy. The study was exempted from ethical review by the Research Ethics Board at the University of Saskatchewan (BEH 17-170).

Our international authorship team aimed to recruit an international sample of participants. After a literature review, two authors (BT and SG) developed survey questions in accordance with current best practices in survey design.⁹ Five other study authors with experience in medical podcasting reviewed and edited the questionnaire to ensure relevance to the constructs of interest. The survey was piloted by the authors of FluidSurvey software in August 2017. The pilot resulted in minor modifications to the survey, including adding questions, shortening the number of questions per survey page, and refining of the wording of existing questions.

We followed the Medical Education Translational Resources: Impact and Quality (METRIQ) Study's participant recruitment process to recruit a cohort of emergency clinicians who listen to podcasts.¹⁰ This included sharing an infographic (Appendix A) on email, Facebook, and Twitter; using the #FOAMed hashtag on Twitter to target a virtual community of emergency and critical care clinicians; and recruiting from our personal networks using email. We also invited

Table 1. Podcast listening habits

	Variable	n (%)
Activities generally performed while listening to podcasts	Driving	284 (72.8)
	Exercise	155 (39.7)
	Chores	153 (39.2)
	Other (unclassified)	49 (12.6)
	Other (walking)	18 (5.8)
	Other (public transit)	9 (2.9)
	None	25 (6.4)
Frequency of note-taking while listening to podcasts	Never	271 (69.5)
	One-fourth of the time	90 (23.1)
	One-half of the time	21 (5.4)
	Three-fourths of the time	3 (0.8)
Frequency of pausing podcasts while listening	Always	5 (1.3)
	Never	31 (7.9)
	Rarely	127 (32.3)
	One-fourth of the time	102 (26.0)
	One-half of the time	65 (16.5)
Reasons for pausing the podcast	Three-fourths of the time	18 (4.6)
	Nearly every podcast	50 (12.7)
	Listening was interrupted	285 (72.5)
	To allow the processing of content	178 (45.3)
	To break up podcasts into digestible segments	125 (31.8)
Frequency of replaying segment of podcasts	To allow memorization of information	63 (16.0)
	Other	23 (5.9)
	Never	40 (10.2)
	Rarely	135 (34.4)
Reason for replaying segments of podcasts	One-fourth of the time	122 (31.0)
	One-half of the time	48 (12.2)
	Three-fourths of the time	23 (5.9)
	Nearly every time	25 (6.4)
	To ensure information wasn't missed	225 (57.3)
	I know I missed information	203 (51.7)
Frequency of repeating entire podcasts	To reinforce information	202 (51.4)
	Other	19 (4.8)
	Never	95 (24.2)
	Rarely	206 (52.4)
	One-fourth of the time	67 (17.0)
	One-half of the time	17 (4.3)
Reason for repeating entire podcasts	Three-fourths of the time	4 (1.0)
	Nearly every time	4 (1.0)
	To reinforce information	232 (59.0)
	I know I missed information	88 (22.4)
Reason for repeating entire podcasts	To ensure information wasn't missed	78 (19.8)
	Other	34 (8.7)

collaborators from a previously published series of METRIQ studies using email.¹⁰

Recruitment material directed prospective participants to an intake form (Supplemental Material Appendix B) hosted at <https://METRIQstudy.org>. The intake form collected the name, email, profession, and level of training of prospective participants. Its completion was considered an expression of interest in the study. A link to the study survey was sent to prospective participants within 24 hours of completing the intake form. Reminder emails were sent every 1–2 weeks, up to a maximum of four times. The initial email was sent by SG, and follow-up emails were sent by BT. To incentivize participation, participants who completed the METRIQ podcast study were acknowledged as collaborators.

Participants formally enrolled in the study by completing a form at the beginning of the survey (Supplemental Material Appendix C) that contained the study consent. Raw survey data were exported from FluidSurveys, and descriptive statistics were calculated using Excel (Microsoft Corp., Redmond, WA, USA).

RESULTS

Recruitment occurred between September 10 and December 9, 2017. The survey remained accessible until March 8, 2018. Four hundred fifty-seven health care professionals expressed interest: 394 (86.2%) formally enrolled, and 390 (85.3%) completed the survey. The average age of the participants was 33.3 years (standard deviation [SD] 8.8), with a slight male predominance (54.8%) (Supplemental Material Appendix D). While most were from North America (68.7%), participants represented 34 countries. A majority (59.4%) of study participants (attending physicians, nurses, paramedics, and physician assistants) represented populations whose use of medical podcasts had not been described previously. Non-physicians (nurses, paramedics, and physician assistants) comprised 31.7% of the population. A minority (9.7%) of participants managed, owned, or operated their own podcast. Most listened to podcasts at least monthly (79.0%).

Participants cited multiple reasons why they listened to medical podcasts. There was significant overlap in those who used them to review the literature (75.8%), learn core material (75.1%), and refresh memory (71.8%). Inspiration (45.5%), entertainment (40.7%), and connecting with the community (36.4%) were also

cited as reasons for listening by a minority of participants.

Most (93.6%) participants performed other activities while listening. Driving (72.8%), exercise (39.7%), and chores (39.2%) were the most frequent activities (Table 1). The use of active learning strategies was variable. Few participants took notes while listening (69.5% never; 23.1% “about one-fourth of the time”). Many (60.3%) reported pausing podcasts at least one-fourth of the time, but this was most often because they were interrupted (72.5%) and only rarely to allow processing of content (45.3%) or memorization (16.0%). Replaying parts of podcasts was more common than replaying entire episodes.

Despite the finding that most (61.8%) of the participants were aware that they could change the listening speed of podcasts, just under one-quarter of participants (23.1%) did so, with most (76.1%) opting to listen at 1.0× (normal) speed.

DISCUSSION

This study aimed to focus future research by understanding how and why emergency and critical care clinicians consume podcasts for education. It is unique among the few descriptive studies on related topics that have been published both because of its international and interprofessional participant pool and its investigation of *how* clinicians are using podcasts.

Our findings may help medical educators and podcast producers to understand their learners and listeners better in the domains of demographics, concurrent activity, motivations for listening, frequency of consumption, and active learning strategies employed. The results suggest that medical content focused on reviewing and learning clinical material is extremely important. Consistent with developing theories on the role of educational entertainment,¹¹ a subgroup of participants endorsed a desire to be inspired and entertained. The finding that greater than one-third of participants listened to podcasts to foster a sense of community may have been inflated by our recruitment methodology, which specifically sought out participants in a community of practice. However, it is consistent with qualitative explanations of the listening motivations of residents.¹²

While most participants listened with the goal of learning from podcasts, this contrasted with their behaviours while listening. It is likely that unrecognized inattention while conducting other activities is

detrimental to retention. Only a minority used active learning strategies that could aid retention (e.g., note-taking, pausing, repeating segments, and repeating episodes).^{5–8} Research exploring the impact of concurrent task completion and active learning techniques on the retention of podcast content is needed. For now, listeners could consider trying these techniques while podcast producers could encourage them within their recordings.

As a survey-based study with a social media-based recruitment strategy, our results have numerous limitations. This is the largest study to date on this topic and the only one to include multiple professions and an international sample. However, we could not calculate a traditional response rate because of the recruitment methodology,¹⁰ and the characteristics of the population of interest (emergency and critical care clinicians who listen to podcasts regularly) were not available to compare with our sample. As 9.7% of our participants managed, owned, or operated their own podcast and a significant proportion were recruited from the authors’ personal networks, the sample might not have been representative of this group. Finally, our sample was limited to those with English-language proficiency who resided in countries with enough internet bandwidth to allow for podcast downloading or streaming. This likely contributed to the high proportion of participants from developed, English-speaking countries.

CONCLUSION

Emergency clinicians use medical podcasts predominantly for learning. Most perform concurrent tasks, and few utilize active learning strategies. Several active learning techniques were used by a minority of participants that could be adopted more broadly and encouraged by podcast producers. Further exploration of the effectiveness of these techniques should be explored.

SUPPLEMENTARY MATERIAL

The supplementary material for this article can be found at <https://doi.org/10.1017/cem.2019.427>.

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REFERENCES

1. Cadogan M, Thoma B, Chan TM, Lin M. Free Open Access Medication (FOAM): the rise of emergency medicine and critical care blogs and podcasts (2002–2013). *Emerg Med J* 2014;31 e1:e76–7.
2. Cho D, Cosimini M, Espinoza J. Podcasting in medical education: a review of the literature. *Korean J Med Educ* 2017;29(4):229–39.
3. Purdy E, Thoma B, Bednarczyk J, Migneault D, Sherbino J. The use of free online educational resources by Canadian emergency medicine residents and program directors. *CJEM* 2015;17(2):101–6.
4. Riddell J, Swaminathan A, Lee M, et al. A Survey of Emergency Medicine Residents' Use of Educational Podcasts. *West J Emerg Med* 2017;18(2):229–34.
5. Prince M. Does active learning work? A review of the research. *J Eng Educ* 2004;93(3):223–32.
6. Zanussi L, Paget M, Tworek J, McLaughlin K. Podcasting in medical education: can we turn this toy into an effective learning tool? *Adv Health Sci Educ Theory Pract* 2012;17(4):597–600.
7. Hargis J, Schofield K, Wilson D. Fishing for learning with a podcast net. *i-manager's J. Educ Technol.* 2008;4(4):33–8.
8. Scutter S, Stupans I, Sawyer T, King S. How do students use podcasts to support learning? *Australas J Educ Technol* 2010;26(2):180–91.
9. Artino Jr AR, La Rochelle JS, Dezee KJ, Gehlbach H. Developing questionnaires for educational research: AMEE Guide No. 87. *Med Teach* 2014;36(6):463–74.
10. Thoma B, Paddock M, Purdy E, et al. Leveraging a virtual community of practice to participate in a survey-based study: A description of the METRIQ Study Methodology. *AEM Educ Train* 2017;1(2):110–3.
11. Moyer-Gusé E. Toward a theory of entertainment persuasion: explaining the persuasive effects of entertainment-education messages. *Commun Theory* 2008;18(3):407–25.
12. Riddell J, Robins L, Brown A, et al. Independent and interwoven: A qualitative exploration of residents' experiences with educational podcasts. *Acad Med.* 2019; epub, doi: 10.1097/ACM.0000000000002984

APPENDIX: The METRIQ Podcast Study Collaborators (in alphabetical order by last name)

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