

A qualitative study of health care providers' uptake of the Project Extension for Community Health Outcomes (ECHO) for chronic pain

Short title: Qualitative inquiry of Project ECHO chronic pain

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Abstract

Introduction. There is an enormous need for pain education among all health care professions before and after licensure. The study goal was to explore generic and chronic pain-specific factors that influenced uptake of a continuous education program for chronic pain, the Project *ECHO*[®] *CHUM Douleur chronique*.

Methods. The study team conducted 20 semi-structured virtual interviews among participants of the program. Interviews were transcribed verbatim and two analysts used a reflexive thematic analysis approach to generate study themes.

Results. Five aspects facilitating engagement, continued participation and uptake of the Project *ECHO*[®] were identified: rapid access to reliable information, appraising one's knowledge, cultivating meaningful relationships, breaking the silos of learning and practice, and exponential possibilities of treatment orchestrations for a complex condition with no cure. While participants' experiences of the program was positive overall, some obstacles to engagement and continued participation were identified: heterogeneity of participants' profiles, feelings of powerlessness and discouragement in the face of complex incurable pain conditions, challenges in applying recommendations, medical hierarchy and missed opportunity for advocacy.

Discussion. Many disease-specific and contextual factors contributed to an increased motivation to participate in the *ECHO* program. Some elements, such as the complexity of diagnosis and treatment, and the multidisciplinary requirements to manage cases were identified as elements motivating one's participation in the program but also acting as a barrier to knowledge uptake. These must be understood in the broader systemic challenges of the current health care system and lack of resources to access allied health care.

Key words: Project *ECHO*, chronic pain, continuous education, qualitative, multidisciplinary

In Canada, optimal chronic pain treatment is a big challenge for patients^{1,2} and for primary care physicians and allied health care providers who are often ill-equipped to manage this condition.³⁻⁵ Despite recent efforts to improve the medical curriculum,⁶⁻⁸ a recent report from the Canadian Pain Taskforce highlighted significant knowledge gaps in pain prevention and treatment practices before and after licensure.⁶ Available educational content also typically lacks integration of the fundamental biological, psychological and social dimensions of pain experience and treatment.⁹ This knowledge gap is surprising given that one in five individuals live with chronic pain, and this condition costs between 38.3 and 40.4 billion dollars in direct and indirect health care costs per year.³

To palliate this knowledge gap, the original Extension for Community Healthcare Outcomes (ECHO) modelTM for Hepatitis C virus, was adapted for chronic pain and opioid stewardship and launched in various countries. This model originates from Albuquerque, New Mexico, and aims to democratize knowledge through interactive videoconferencing sessions (see Table 1 for details). An interdisciplinary panel of experts in the management of a health condition provides education through formal didactics and case-based learning to health care workers in primary and secondary care, in remote or underserved communities.¹⁰⁻¹⁴ The specialist' expertise is subject to “force multiplication”, leading to a dynamic that increases knowledge-sharing beyond one-on-one consultations.¹⁵ The model has been replicated in 45 countries.¹⁶ As of January 15, 2021, there were 148 ECHO chronic pain and/or opioid stewardship programs across mainly America and Europe.¹⁶

Two systematic reviews have been published on the impact of Project ECHO[®] on health care providers.^{17, 18} Results suggest that this continuous education modality is positively influencing provider satisfaction, knowledge and clinical confidence. The strength of evidence was rated as low however, and all reviews called for more research on this education innovation model.

The literature on Project ECHO[®] across various chronic pain and opioid stewardship programs is sparse.¹⁹ Overall, quantitative studies found inconsistent benefits of participating in Project ECHO[®] for health care providers in terms of knowledge of pain management, levels of confidence in their clinical abilities, self-efficacy and satisfaction.^{15, 20-25} Using a qualitative methodology, some studies showed that participants in Project ECHO[®] chronic pain found the program overall effective, perceived having improved their competence (patient engagement and care, evidenced-based approaches, appropriate referrals and prescribing opioids), had the opportunity to engage in knowledge dissemination, and felt part of a community.^{26, 27}

The study goal was to explore generic and chronic pain-specific factors that influenced uptake of the *Projet ECHO[®] CHUM Douleur chronique* to inform other provincial and out of province care systems considering Project ECHO[®] chronic pain. This knowledge could be useful to those who are looking to launch a Project ECHO[®] or those looking to optimize its impact. This objective was assessed using Moore's evaluation framework.²⁸

Methods

Structure of the Project ECHO® CHUM Douleur chronique

The *Project ECHO® CHUM Douleur chronique* was launched in September 2017. During its first cycle, a limited number of participants attended (10 on average) the sessions. The program grew over time and during its 3rd cycle, 30 (range: 9-48) participants were present on average at any given session. The teleclinics²⁹ occurred once weekly over a 10-month period, for a total of 30 sessions per cycle. During a clinic, health care providers (spokes) primarily from primary and secondary care and pain experts (hub) discuss a case presented by a spoke for 45 minutes and recommendations are made. The last 15 minutes are dedicated to an expert presentation on various topics related to chronic pain management (pain evaluation and diagnosis, medical interventions, specific pain pathologies, psychotherapy for chronic pain, role of pharmacists, physiotherapists and occupational therapists in chronic pain management, neuropathic pain, medications for chronic pain (opioids, cannabinoids), pain and addiction, pain management in specific populations, and risk factors for chronicity or poor treatment response. The hub is comprised of experts working in a tertiary care pain clinic and is multidisciplinary (anesthesiology, nursing, family medicine, patient partner, pharmacy, physiotherapy, psychiatry, psychology, social work). There were on average 13 members of the hub present at each session. More details about the program can be found here: <https://ruisss.umontreal.ca/cegcd/echo-douleur-chronique/>. Data collected in this study came from individuals who participated in one or more of the first three cycles of the program, thus during program implantation and expansion.

Study Design

This study adopted a qualitative case study,³⁰ cross-sectional design involving 20 individual interviews conducted between September 2018 and July 2020. The study was approved by the Institutional Review Board of the Centre hospitalier de l'Université de Montréal (CHUM) (17.085). The Standards for Reporting Qualitative Research (SRQR) were followed.³¹

A constructivist paradigm³⁰ was selected to frame the study, as the ontological belief is that reality is a locally and specifically constructed representation and acknowledged the inevitable subjective stance of those involved in constructing and carrying out the research. The researchers thus play a role in recognizing and constructing interpretations out of multiple perspectives gathered from participants.

Participants

Participants from the *Project ECHO® CHUM Douleur chronique* (2017-2020) were initially informed of the study during teleclinics and those interested in participating in a research project were contacted by a research professional. To be eligible, individuals must have been a health care provider, be 18 years of age or older, and have participated in at least one teleclinic. An opportunistic sampling approach was then used in order to recruit participants with different levels of exposure to the program (e.g., those who participated in fewer than 5 teleclinics and those who participated in most teleclinics in a given cycle) and from different professional backgrounds. More specifically, sampling decisions were made during the process of data collection to further explore and gain more information about unfolding knowledge from individuals with specific professional background or from different levels of exposure to the Project ECHO®. Individuals meeting these criteria in terms of professions or level of exposure to the Project ECHO® were

emailed by the Project ECHO® coordinator to inform them of the research project and provide them with contact information of the research team.

Procedure

Eligible and interested participants completed socio-demographic questions and signed an electronic consent form prior to the interview. The interviews were conducted virtually using Zoom video communication system by a trained and experienced research professional using a semi-structured interview guide. These interviews, which lasted between 13 and 84 minutes (median: 32 minutes), were audio recorded and transcribed verbatim. The research team felt that after having completed 20 interviews, a balance was achieved between diversity and novelty of experiences and redundancy across interviews; recruitment was then stopped.

The interview guide evolved as the data collection progressed, and was initially designed to gather information according to Moore's program evaluation framework for continuous medical education.²⁸ More specifically, the guide was developed to explore specific levels of Moore's framework, namely participants' satisfaction (level 2), learning (declarative - level 3), and competence (level 4). Given the nature of the data collected, other levels of the framework (participation, performance, patient health and community health) were not directly included in the interview guide. Additional questions assessed barriers and facilitation to initiating and maintaining participation in Project ECHO®.

Different strategies were put in place to enhance trustworthiness of the qualitative inquiry.³² Investigator triangulation and prolonged engagement with the data were used to enhance credibility. Description of the context of the Project ECHO® locally was used to enhance

transferability. Audit trails were used to enhance confirmability of findings. Finally, diaries and memos were used to enhance reflexivity.

Data Analysis

Two research team members from different interdisciplinary backgrounds conducted the data analysis.³³⁻³⁵ Researchers analyzed the transcribed interviews using a reflexive thematic analysis framework.³⁶⁻³⁸ Through an iterative process, each analyst generated semantic and summary codes; and as the analysis progressed they generated latent codes that reflected the deeper understanding and interpretation of the data and grouped them under themes. This process took place through frequent discussions between the analysts to arrive at a joint understanding of the participants' experience. Written memos that identified and characterized variations in participants' narratives evolved over time, and were contrasted as themes and their dimensions were constructed and elaborated on.³⁹ The analysis was conducted using NVivo® Software⁴⁰ and Dedoose Software⁴¹ based on platform access and preferences of analysts, and comparisons and contrasts of themes and dimensions were shared across platforms. The analysis took place in the language the interviews were conducted in; selected quotes were translated into English for publication.

Study Team

The study team is comprised of medical professionals, managers, a coordinator involved in the Project ECHO®, a researcher and research coordinator. All were involved in the study design and approved the final version of the manuscript, but only the researcher and research coordinator were involved in the data collection and analyses. The researcher is a health psychologist with expertise in chronic pain. The research coordinator has a background in social science and experience in qualitative studies. Neither was involved in Project ECHO® sessions or known to participants

prior to data collection. The researcher had some training in the ECHO® model and thus approached this study with prior theoretical knowledge of ECHO® principles and objectives, and evaluation framework (Moore's model).²⁸

Characteristics of Participants

Participants' socio-demographic and professional characteristics are shown in Table 2. Most were working in an urban centre and approximately half of participants were dedicating more than 50% of their clinical time to treating individuals living with chronic pain.

Findings

This section focuses on the central domains of Project ECHO® participants' experiences that facilitated or hindered their engagement, continued participation in and uptake of the *Project ECHO® CHUM Douleur chronique*. These themes are summarized in Table 3.

Facilitating Engagement, Continued Participation, and Uptake

Participants' reflections covered a breath of positive experiences. Five specific dimensions of these experiences were meaningfully derived from their narratives.

Rapid access to reliable information. There is historically a lack of training in chronic pain among health care providers. This situation leaves clinicians vulnerable to misinformation. The possibility of gaining reliable knowledge was an important motivational factor for many participants.

Pain education, hum, we know that no one is trained properly in pain and especially not when I graduated from medicine in the [1980s]... Nonetheless, I think that ways of thinking drastically changed throughout my career, and I wanted to become more knowledgeable to manage pain.

(P018, male, 60-69 years old, family doctor)

Given the number of scientific articles published every year and the number of medical conditions general practitioners treat daily, it becomes a challenge to keep up with scientific knowledge. Project ECHO® offered an alternative to knowledge gathering and synthesis, making it easier for them to apply this knowledge in their own practice.

I was reading most of the articles, but we cannot read everything... But when we have an expert like [ECHO clinical lead], that comes and talk

to us about fibromyalgia and that tells us that these and these laboratory results are interesting or not for this type of patient, well really... this registers directly in my brain... (P157, male, 40-49 years old, allied health care provider)

Appraising one`s knowledge. Many participants were surprised to realize the extent to which their pre-ECHO knowledge was deficient.

Well, it`s fluctuating, but I would say that at the beginning, I was thinking “Well, I`m someone who knows about this,” so that`s that. After a while, I was telling myself, “Oh my god, things have changed so much, I don`t know anything anymore!” And then now I`m telling myself, “Well, I`m starting to know a little bit more!” (laughs). (P023, Female, 50-59 years old, nurse)

Cultivating meaningful relationships with colleagues and patients: when an under-recognized and complex pathology facilitates bonding. Clinicians felt like they belonged to a team of health care providers with shared interests and experiencing similar challenges and emotional reactions to these challenges. These elements helped individuals feel more hopeful about chronic pain management and realize that gains can be made despite limited availability of resources.

There is also an aspect related to sharing... sharing challenges, which is interesting. It is comforting in a way to know that we are not the only one to have these issues, and also to know that there are things you can do

with little resources. (P332, female, 20-29 years old, nursing clinical manager)

The notoriety of the tertiary care pain clinic running the Project ECHO® within the provincial health ecosystem helped clinicians feel more confident in the treatment plan and recommendations established during the sessions, which in turn facilitated communication with and engagement from patients.

I really feel like there is a consensual intervention plan, with all the clinicians. And I think it allows you to hold your ground when you speak with a patient... (P037, Female, 30-39 years old, nurse)

Breaking the silos of learning and practice. In the context of scarce health care resources, participating in the Project ECHO® helped participants build a network of health care providers with an interest in chronic pain. This seemed important for many participants who appreciated these opportunities for consultation and referrals, and breaking the isolation of independent practice.

When people talk about some topics that touch me, it`s fun. Like with the nutritionist, I`m like okay, that`s cool. Is there a chance for us meeting, or is she on the other side of the world? Could we refer each other patients? Could we talk about issues together? It`s all those things that I`m interested in. (P051, female, 30-39 years old, allied health care provider)

Many participants did not have the opportunity to work or exchange with colleagues from other disciplines in their daily practice. Project ECHO® offered an easy, simultaneous access to multiple

perspectives on a single case. This also provided participants with an opportunity to be challenged by colleagues with complementary knowledge and improve their skills.

Me personally, I always have the right diagnosis in my office, because I am by myself ... So, to confront your impressions often they are just clinical impressions, ideas we have, with a line of thinking that can be completely different... I mean it's a privilege to be able to present cases, to be able to do that. (P157, male, 40-49 years old, allied health care provider)

Exponential possibilities of treatment orchestration for a complex condition with no cure. In the absence of curative treatments and the multiplication of treatment algorithms, the clinical decision-making process for any given patient can be very challenging. The Project ECHO® helped professionals acquire knowledge about chronic pain treatment options, but also importantly about realistic treatment expectations for this population.

[My patient], she still has pain, she still fights her addiction. That's the thing I've learned the most with ECHO, and by doing all of my readings and all that, my thought is that people won't go from 10 out of 10 in pain levels for the past 10 years, to a 0 out of 10 after 2 medications. It's more a palliative treatment I would say... (P018, male, 60-69 years old, family doctor)

Obstacles to Engagement, Continued Participation, and Uptake

While many participants described an overall positive and rich experience of the Project ECHO®, some structural and pain-specific challenges hindered one's continued participation in or ability to derive benefits from the program.

Heterogeneity of professional backgrounds and experiences. For some, the heterogeneity in the number of years practicing pain medicine among participants made it difficult to use the acquired knowledge with their own patients (e.g., recommendations were too advanced or too basic) and led some participants to refrain from presenting cases. Some of them felt ill-equipped to present information about a patient that was outside their scope of practice or when they did not have support from their local team to detail the case from a multidisciplinary perspective.

For the case to be complete and pertinent, well it requires that you have all the team members that help us collect the data and all that. And when I brought, because I asked a few times, like most of the participants probably, I asked my team and I did not have their collaboration at that point. So that too was an obstacle. (P338, female, 40-49 years old, allied health care provider)

Most participants recognized the pertinence of the multidisciplinary environment within the program. However, the heterogeneity of professional disciplines made it difficult for some to learn about advanced or specific knowledge within a specific discipline, and to share with other professions. This challenge was more evident among allied health care providers.

To have Zoom sessions just between psychologists, that could be interesting too ... Because I think people will start to talk... Because I think we have to keep the same multidisciplinary atmosphere if we want doctors to believe in it more... Maybe that would attract more psychologists at that point, because otherwise we always have the impression that this medical hierarchy is maintained. (P369, female, 40-49 years old, allied health care provider)

Feelings of powerlessness and discouragement in the face of complex incurable pain condition. Discussing complex cases sometimes led to a feeling of powerlessness and discouragement; this was particularly salient when facing difficulties related to pain diagnosis in the absence of objective measures or coming to terms with the impossibility of a curative treatment.

It is somewhat downgrading to present cases that, I wouldn't say that are failures, but where your ego is challenged because you are presenting a very difficult case. You are admitting that you are not able to find a solution.

(P157, male, 40-49 years old, allied health care provider)

Recommendations lost in translation: No one size fits all. Diversity of opinions and perspectives among ECHO participants were frequent. Appreciated by some, this diversity also made it difficult for others to understand the logic behind some recommendations and adapt them to other patients.

And you know, sometimes there is more than one answer, and this has been discussed... Sometimes something within me really did not agree. But the main presenter, let's say, her as well she would say, "I'm not really sure about this, for me I don't really think that...", so you know, for sure there will always be people who have different opinions [on what the right treatment is]. (P101, female, 30-39 years old, medical specialist)

Over-emphasis on medical solutions when resources are lacking. Many participants highlighted the disproportionate emphasis on pharmacological approaches to the detriment of psychosocial

and other allied health perspectives. This was understood in the context of lack of access to other approaches and a desire to generate realistic, applicable recommendations.

It was a lot geared toward the medical aspects, but there was also a lot of medical staff involved. Of course, I have a professional bias, but I find that the medical is often... overused... And often this is not where you will obtain the best results for improving [patients'] quality of life, or what we call a recovery among our patients. (P338, female, 40-49 years old, allied health care provider)

Missed opportunity: lack of advocacy in the context of poor treatment access. Most of the challenges to knowledge uptake identified previously were understood in the context of deficient health care resources to offer the gold standard multidisciplinary treatments to all patients. The ECHO recommendations thus had to offer a balance between recognizing what the optimal therapeutic path would be for a patient, and what this patient could realistically have access to within a reasonable time. However, a small number of participants perceived that the Project ECHO®, because of its visibility on the provincial scene, should seize this opportunity and adopt an advocacy role that was currently absent from the conversations.

Maybe we can hope for another ideal in the ECHO training. Because that would be a lot more motivating, otherwise we are forced to say that we will only do what we have the means to do currently. So, it could also be a way for ECHO to go further, to advocate... a little bit for the needs of patients. (P369, female, 40-49 years old, allied health care provider)

Discussion

Study results suggest an overall positive but nuanced experience of the Project ECHO® for chronic pain launched in Montreal, Canada. The initial ECHO model was developed to democratize knowledge about Hepatitis C virus treatment.¹² Unlike Hepatitis C virus treatment, chronic pain is inherently subjective, determined by multiple biopsychosocial factors, and there are few biological indicators available to help with diagnosis or determination of its severity. As a result, its treatment is inevitably based in multidisciplinary efforts, and treatment recommendations are highly variable across patients. These characteristics have coloured participants' experiences and appreciation of the facilitators and barriers of the ECHO model and knowledge uptake. In addition, the health care system locally is free and almost entirely public. There are as such important delays in accessing health care for specialized chronic pain programs, but also for multidisciplinary resources, such as psychology and physiotherapy in primary care. Those characteristics of the local health care system also influenced participants' needs and experiences of the Project ECHO®, for example by making the need for developing independence in treating individuals with chronic pain more salient.

In line with results from other ECHO studies^{17, 18} and those specific to chronic pain,^{15, 20-25} several integral characteristics of the ECHO model motivated participants to initiate and maintain participation in the program. This included the rapid access to evidenced-based knowledge, increased ability to accurately evaluate one's knowledge, building a sense of community, and networking opportunities. Hassan and colleagues⁴² explored the inter-professional aspects of Project ECHO® chronic pain program and found that this model led to positive changes in levels of interactions between colleagues from different professions.⁴² The same research group has also

recently identified additional sources of motivation among participants, including the desire to build new knowledge, facing complex and challenging patients, and dissatisfaction with current models of care.⁴³ Unlike their results, issues regarding the use of opioids as a therapeutic arsenal in chronic pain was rarely discussed in the present study, which is surprising considering that hierarchy of pharmacological approaches was an identified barrier to knowledge uptake by some participants. This might be because the province of Quebec has lower rates of opioid prescriptions and fewer opioid-related deaths per capita than many other Canadian provinces.^{44, 45}

Other facilitators of engagement and retention were more specific to chronic diseases requiring multidisciplinary care, such as the importance of breaking the silos of learning and practice, and the complexity of treating a condition with poor objective diagnostic measures. A study of Veterans Affairs ECHO® Chronic Pain program found that many participants perceived a sense of community that developed throughout the program, which helped them to face the challenges of managing an incurable, debilitating chronic health condition.²⁶ Other models geared at creating a community of practice also report that such management approach to chronic pain leads to improved clinicians' confidence in their ability to manage pain and communication skills.^{25, 26}

In line with results from other Project ECHO® programs, most of the identified challenges were related to inherent characteristics of existing treatment models. For example, Moeckli and colleagues⁴⁶ found that when multidisciplinary or interdisciplinary settings are not in place, it might be difficult for ECHO programs to alter traditional, one-dimensional patterns of care in primary settings. This issue becomes then an important disruptor of health care innovation typically associated with ECHO models. In addition, the lack of buy-in from other members of

multidisciplinary or interdisciplinary pain clinics in primary care appears to be common and reported by other Project ECHO® groups.⁴³

Many participants negatively perceived the presence of a hierarchy where pharmacological approaches were given more weight. This might in part reflect the particularities of the universal health care system in Canada. As recently highlighted by the Canadian Pain Taskforce, pain is under-recognized and under-financed and multiple challenges exist in terms of timely access to patient-centred pain care, gaps in awareness, education and availability of specialized training for pain, and deficient population health and health system quality monitoring systems.⁶ Feelings of discouragement and powerlessness were reported by participants who wondered how they could optimally use the multidisciplinary knowledge gained during the ECHO sessions in the reality of their clinical practice. A minority of participants felt there was a social responsibility of this type of program to adopt an advocacy role and use its visibility to sensitize various stakeholders to the reality of chronic pain in the province. Interesting advocacy innovations related to the ECHO model have been created with this goal in mind.⁴⁷ If integrated in the ECHO program, this could raise awareness about chronic pain within the provincial health ecosystem.

Study Limitations

This study has some limitations in its attempt to fulfill the stated goal of exploring generic and chronic pain-specific factors that influenced uptake of the *Project ECHO*®. First, this study used an opportunistic sampling approach and initially participants self-selected to participate in these interviews. As such the opinions gathered in this study reflect those of individuals with enough interest in ECHO to volunteer time to participate in this study. It is possible that participants,

particularly those who attended few sessions, were harder to identify and thus missed. In addition, participants were only interviewed after their participation in the program, making it impossible to contrast their experiences with their expectations prior to starting the program. Changes over time in their perceptions of the program could also not be assessed. Also, we did not interview experts and members of the hub for this study, and could not contextualize further the data obtained from spokes. Additional data sources would be required to continue exploring the validity of these perceptions and increase trustworthiness of the data. Interviews were conducted at a single Project ECHO®; however many of the themes were also found in the existing literature from other ECHO Chronic Pain programs in North America. Furthermore, we relied on interview transcripts given by spokes and did not include data that examined other sources of knowledge, such as medical records, that could inform on the product of knowledge uptake from the Project ECHO®.

Conclusions

The challenges inherent to the management of chronic pain were identified as positive characteristics that motivated participants to engage in the program, to create a sense of community, and to widen their knowledge base of chronic pain. Ironically, these same characteristics were also identified as barriers to participation, particularly regarding the uptake of recommendations that are sometimes outside of one's scope of practice or are not accessible for patients. These must be understood in the broader systemic challenges of the current health care system in Canada and lack of resources to access allied health care. This has important implications for the structure of ECHO, as it points toward the need for an advocacy role of the program within the health care system and a proactive approach in building a multidisciplinary network and connecting health care professionals in chronic pain. Recruitment efforts targeting allied health

care professionals could also help further disseminate knowledge and increase treatment access in primary care for multidisciplinary treatments.

Lessons for Practice

- Opportunities for learning in multidisciplinary settings are rare and a driving force of the ECHO models. However, this type of learning should be flexible and sensitive to the needs of each profession to facilitate engagement and uptake.
- The knowledge uptake of continuing education programs that targets complex, multidisciplinary treatments is limited by systemic factors such as scarce resources. Combining advocacy roles with those education programs could help improve the health care ecosystem and facilitate knowledge implementation.

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Table 1. Characteristics of Project ECHO knowledge building model

Characteristics of the ECHO model	Details
Sharing best practices	Experts and spokes (participants) share knowledge about best practices. In this model spokes learn from experts and vice-versa, similar to peer mentoring.
Case-based learning	Case-based learning is the central education component. Each session one or more cases is shared by a spoke. Discussion ensues and this culminates by recommendations about the case.
Didactic learning	Each session also includes a smaller didactic component where one of the experts presents on a specific topic relevant to the specific ECHO program.
Reducing disparities	The model's vision is to reduce disparities in care by moving knowledge and not patients. This means that by sharing expert knowledge with clinicians in remote and rural areas, patients have increased access to optimal care in their own communities.
Technology-based learning model	Multipoint videoconferencing and Internet are used to connect experts and spokes (participants) to disseminate knowledge and learn
Principles of the model: Amplification: Best practices: Case-based learning: Data:	Technology allows to leverage scarce resources Best practices are shared to reduce disparities in care This learning approach helps master complexity Data monitoring of ECHO programs allows to assess its impact
Structure of the Project <i>ECHO® CHUM Douleur chronique</i>	<ul style="list-style-type: none"> - Weekly 1-hour session - 30 sessions per cycle (25 during COVID-19) - Multidisciplinary hub and spokes - Spokes coming from primary and secondary care - 1 case-based learning and a 15-min didactic presentation per session

Table 2. Participants' sociodemographic and professional characteristics

	N [%]
Profession	
Family physician	6 (30%)
Nurse / Nurse practitioner	4 (20%)
Pharmacist	3 (15%)
Specialist physicians	2 (10%)
Psychologist	2 (10%)
Other allied health providers (kinesiologist, occupational therapist, osteopath)	3 (15%)
ECHO cycle	
2017-2018	10 (50%)
2018-2019	8 (40%)
2019-2020	2 (10%)
Number of teleclinics attended	
≤ 5	4 (20%)
6-10	3 (15%)
11-15	7 (35%)
16-20	3 (15%)
> 20	3 (15%)
Work region	
Urban	12 (60%)
Semi-urban	4 (20%)

Rural/Remote	2 (10%)
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Missing	2 (10%)
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Percentage of their clinical work dedicated to

treating chronic pain patients

> 50%	9 (45%)
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≤ 50%	9 (45%)
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Missing	2 (10%)
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Age

20-29 y.o.	2 (10%)
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30-39 y.o.	6 (30%)
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40-49 y.o.	4 (20%)
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50+ y.o.	6 (30%)
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Missing	2 (10%)
---------	---------

Gender

Women	14 (70%)
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Men	6 (30%)
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Table 3. Summary of the main themes generated from the data analysis

Aspects facilitating engagement, continued participation, and uptake

1. Rapid access to reliable information
2. Appraising one's knowledge
3. Cultivating meaningful relationships with colleagues and patients: when an under-recognized and complex pathology facilitates bonding
4. Breaking the silos of learning and practice
5. Exponential possibilities of treatment orchestration for a complex condition with no cure

Obstacles to engagement, continued participation and uptake

1. Heterogeneity of professional backgrounds and experiences
 2. Feelings of powerlessness and discouragement in the face of complex incurable pain condition
 3. Recommendations lost in translation: No one size fits all
 4. Over-emphasis on medical solutions when resources are lacking
 5. Missed opportunity: lack of advocacy in the context of poor treatment access
-

Semi-structured interview guide

Part 1 : Program 's impact

1.1 Expectations: overall impressions of the program

Please tell me about your experience of the ECHO program.

- In which ways have the sessions met or did not meet your expectations? Why?
- What did the program bring you as a professional?

What were your expectations of the program when you first enrolled in it?

Have there been any disadvantages or downsides of participating in the program?

Why did you choose to enroll in the Project ECHO CHUM Douleur chronique?

- Why did you choose to pursue continuous education on the topic of chronic pain?
- In which ways has the virtual format of the program seemed appealing? Or not interesting?

1.2 Impact clinical cases and learning capsules

Clinical cases discussion

How comfortable did you feel to present a case? Why?

- Were there any aspects that made it easier to present a case?
- Were there any aspects that made it harder to present a case?

What do you think of the treatment suggestions made during the various tele-clinics?

- Were they helpful to you?
- What did you conclude?
- Have you noticed any changes in your approaches to treatment?
- Have you identified any barriers or elements that facilitate the implementation of the recommendations?

PROBES : Impact of case discussions on clinical practice

- Did the clinical case discussions bring you anything? what? Have you been able to apply the knowledge gained during those discussions?
- What has changed, in anything, in the perception you have of yourself as a health care provider generally? And particularly regarding pain treatment?

Learning Capsules

What did you think of the capsules ?

PROBES : Knowledge uptake

- Did the learning capsules bring you anything? What? Have you been able to apply the knowledge gained during those capsules?

What has had the most impact on your practice? In which way?

1.3 General impact of the program

Understanding of pain

Que pensez-vous de/Comment qualifiez-vous votre compréhension de la gestion de la douleur aujourd'hui?

- Est-ce qu'elle est la même qu'avant votre participation à ECHO ?
- Comment a-t-elle évoluée depuis le début de votre participation à ECHO ? Sur quels aspects ?
- Qu'est-ce qui empêche votre compréhension de la gestion de la douleur ?

Prise en charge et relation soignant.e-soigné.e

Est-ce que vous référez des patients souffrant de douleur chronique à des confrères ? si oui, pour quel(s) motif(s) ?

PROBES : capacité de prise en charge des patients, références

Y-a-t' il eut des situations lors desquelles vous avez été capable de partager les connaissances acquises via ECHO à d'autres collègues? Donnez-moi un exemple.

Que pensez-vous des recommandations faites pour le(s) cas que vous avez présenté(s) ?

PROBES : les recommandations sont-elles applicables ? Est-il capable de les appliquer ? Si non, quelle(s) en a été la(les) raison(s)?

Comment qualifiez-vous votre relation avec vos patients suite aux discussions de cas cliniques?

- Avez-vous observé des changements dans votre manière de comprendre les besoins de vos patients ? Dans l'évaluation du patient? Dans l'élaboration des objectifs de traitement?

PROBES : qualité de la relation soignant-soigné, compréhension des besoins, Relation perçue, changement ds la façon dont ils abordent la q des besoins avec le patient

Partie 2 : Améliorations

2.1 Accessibilité

Quels sont pour vous, les éléments facilitants votre participation au Programme ECHO ? Quelles ont été les barrières à votre participation au Programme ECHO ?

Que pensez-vous de votre rapport avec les experts du CHUM lors des séances ÉCHO?

PROBES : accessibilité des experts pour obtenir leur opinion au sujet de leurs patients

2.2 Composition des séances/format des séances

Que pensez-vous de la diversité des cas présentés durant le Programme ECHO ?

Que pensez-vous de la diversité des spécialisations représentées par les cliniciens (ou experts?) présents durant les séances ?

2.3 Besoins

Que pensez-vous des télé-cliniques sur la douleur chronique ?

- Qu'avez-vous aimé ? moins aimé ?
- Pensez-vous que vous allez continuer à participer au Programme ECHO ? Pour quelles raisons ?
- Avez-vous des besoins particuliers ?

Que pensez-vous du format des séances ?

- 1 heure, est-ce suffisant ?

Avant que l'on termine, voulez-vous rajouter quelque chose ?

Avez-vous des commentaires? , des retours ?

Avez-vous des suggestions de pistes d'améliorations concernant le programme ECHO?