

Workforce Development to Improve Access to Pain Care for Veterans: A Qualitative Analysis of VA-ECHO Participant Experiences

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Abstract

Background/Objective: The prevalence of chronic pain and its links to the opioid epidemic have given way to widespread aims to improve pain management care and reduce opioid use, especially in rural areas. Pain Management Specialty Care Access Network-Extension for Community Health Outcomes (VA-ECHO) promotes increased pain care access to rural Veterans through knowledge sharing from specialists to primary care providers (PCPs). We explored PCP participants' experiences in VA-ECHO and pain management care.

Methods: This qualitative study is based on a descriptive secondary analysis of semi-structured interviews (n = 10) and 3 focus groups with PCPs participating in VA-ECHO from 2017–2019. A rapid matrix analysis approach was used to analyze participants' responses.

Results: VA-ECHO was an effective workforce development strategy for meeting PCPs' training needs by providing pain management knowledge and skills training (eg alternative care approaches and communicating treatment options). Having protected time to participate in VA-ECHO was a challenge for many PCPs, mitigated by leadership and administrative support. Participants who volunteer to participate had more positive experiences than those required to attend.

Conclusions: VA-ECHO could be used for meeting the workforce development needs of PCPs. Respondents were satisfied with the program citing improvement in their practice and increased confidence in providing pain management care to Veterans despite some challenges to participation. These findings offer insight into using VA-ECHO to meet the VHA's workforce development to improve Veterans' access to pain management care. The ECHO model presents opportunities for workforce development in large complex healthcare systems and garnering ongoing support for this training model is necessary for promoting workforce development for PCPs.

Keywords

pain management, continuing education, workforce development, primary care, virtual

Introduction

Chronic pain is a major public health problem affecting over 20% of the U.S. adult population¹ and is linked to the opioid epidemic in the United States. Individuals in rural areas are particularly impacted due to varying factors, including limited access to pain care since pain management clinics are mainly located in urban medical center settings, reliance on primary care for pain management and barriers to accessing non-pharmacologic pain treatments.^{2,3} The opioid epidemic has prompted widespread

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aims to change pain management practice policies across various settings⁴ to reduce the suffering from pain, while also containing the rising toll of harms associated with opioid medications.³ The Veterans Health Administration (VHA) provides training to primary care providers (PCP) and staff to improve their understanding of and ability to provide pain management care, including providing alternative pain care and strategies for reducing opioid use especially among rural Veterans.⁵ These efforts require practitioners to find balance between providing appropriate chronic pain care and minimizing opioid misuse.

The VHA Specialty Care Access Network-Extension for Community Health Outcomes (SCAN-ECHO, also known as VA-ECHO) program, adapted from Project ECHO^{4,6} was designed to increase rural Veterans' access to specialty care by training VHA PCPs to deliver pain management care. Remote training and mentoring are particularly suited for rural areas where workforce development may not be the focus and less resources are available. Workforce development involves coordination of programs and policies in an organization that influences the success of employees and work system by prioritizing ongoing education and skills development to positively influence the future success of a program.⁷ Although VA-ECHO and similar programs for chronic pain⁸ aim to educate and empower PCPs, the success of these programs is not clear,⁹ particularly as a workforce development strategy. Studies evaluating VA-ECHO demonstrate the program's impact on improving pain management for Veterans, indicating positive outcomes in terms of PCPs' confidence and knowledge of treating chronic pain and higher patient utilization of other health services (ie mental health, physical therapy) as opposed to opioid prescribing.¹⁰⁻¹³

Prior pain management VA-ECHO studies used quantitative measures, including surveys, to measure training outcomes (eg, confidence, knowledge, prescribing trends, patient service utilization).^{11,12} We used qualitative methods to extend our understanding of VA-ECHO as a workforce development strategy for the VHA to improve pain care, a concept that is limited in literature about the ECHO method. This analysis focused on a subset of data from a larger evaluation of Pain Management VA-ECHO.¹⁴ The objective of this paper was to describe how PCPs' participation improved their knowledge and skills for pain care and to inform strategies for workforce development.

Methods

Qualitative methods were used in this study and as part of a larger evaluation of VA-ECHO programs¹⁴ focused on informing the expansion and implementation of VA-ECHO to improve veterans' access to pain management care. Qualitative methods offer a way to understand what is happening, why and how providers and patients are impacted by interventions and can capture complexities and nuances that are immeasurable by quantitative measures.¹⁵ This secondary analysis focused on a subgroup of PCPs who participated in a pain management VA-ECHO program included in the

larger evaluation. We chose to focus on one VA-ECHO pain management program and their participants to control for programmatic variations across VA-ECHO programs included in the original evaluation. Evaluation activities were reviewed by the Research and Development Committee and deemed to constitute healthcare operations and not human subjects research.¹⁶ VHA employee unions reviewed and approved instruments before recruitment and data collection started. Participation in the evaluation was voluntary and participants consented to the use of the anonymized data for reports and future publications.

Participants and Setting

The pain management VA-ECHO program was delivered from a midwestern, urban Veterans Affairs Medical Center (VAMC; hub site; Figure 1) using video teleconferencing technology. The program was led by a multidisciplinary pain management specialist care team. The pain management specialty team invited a cohort of primary care providers (PCPs) delivering care in outpatient clinics within geographically diverse urban and rural VAMCs and VHA Community-Based Outpatient Clinics (CBOCs) (these VAMCs and CBOCs referred to as spoke sites). The specialty team facilitated weekly meetings over the course of one year that included didactic training, mentoring, and case consultations covering a range of pain management topics (Table 1). Sessions lasted approximately one hour. Additional topics were introduced based on participant feedback.

Seventy-five (N=75) PCPs (physician assistants, physicians, and/or nurse practitioners) from five rural and urban midwestern spoke sites were trained between 2016 and 2019. Program attendance data were used to identify these program participants for recruitment.

Data Collection and Analysis

Primary data collection was completed between May and September 2018 by an experienced team of qualitative researchers. A semi-structured interview guide (previously published by Ball and colleagues¹⁴) and focus group guides (Appendices 1.1 and 1.2) were used to explore providers' experiences delivering pain management care and participating in the VA-ECHO program, including facilitators and barriers to attendance, practice changes, perceptions of the impact of program on patient care and access, and suggestions for program improvement. Individual interviews lasted approximately 30 min. Pre- and post-participation focus groups lasted 30 to 60 min. Interviews and focus groups were audio recorded and transcribed for analysis.

Interview and focus group data were aggregated for rapid matrix analysis¹⁷ applying deductive domains¹⁸ (Table 2) from key definitions derived from the literature including workforce development,⁷ confidence in treating pain,¹⁹ barriers to pain management,²⁰ patient-provider communication,¹⁸ alternative care, opioid prescribing for pain management, and

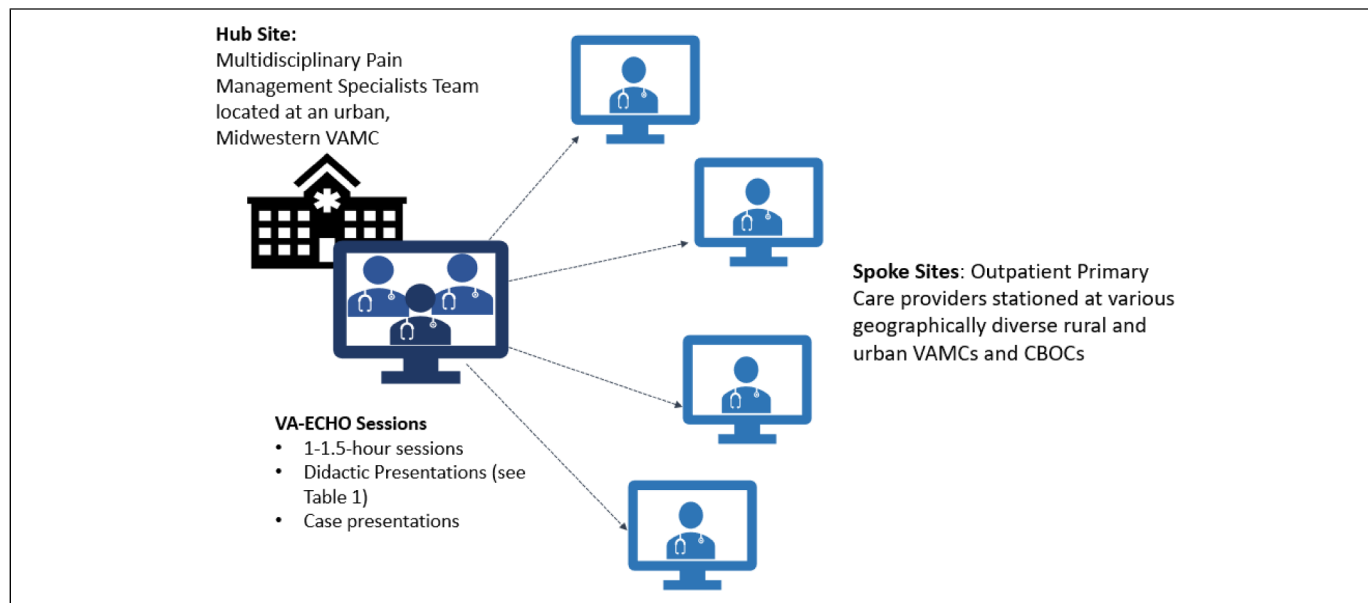


Figure 1. Pain management VA-ECHO program structure.

Table 1. VA-ECHO Curriculum Topics.

The Table Below Lists Examples of Topics Covered in the VA-ECHO Curriculum. Note That Additional Topics Were Discussed Throughout the Program Based on Participant Feedback.

Curriculum Topics	
Conditions and Symptoms	Assessment and Treatment
<ul style="list-style-type: none"> • Comorbid Mental Health • Fibromyalgia • Headaches • Low Back Pain • Neck Pain • Opioid use • Opioids Hyperalgesia • Pain Addiction • Pain in Chronic Pancreatitis • Somatic Symptom Disorder • Spinal Stenosis • Trigeminal Neuralgia 	<ul style="list-style-type: none"> • Acupuncture • Biopsychosocial Model • Center for Disease Control Guidelines • Chronic Pain Post-Surgical • Cognitive Behavioral Therapy • Drug Monitoring • Hip and Knee Management • Legacy Patients • Medication-Assisted Therapy (MAT) • Harm Reduction • Opioid Evidence • Risk Assessment

provider perspectives on pain care.²⁰ Analyses focused on understanding how PCPs’ participation in VA-ECHO improved their knowledge and skills for pain care to inform strategies for workforce development. Inductive domains were added to capture emergent topics (eg experiences with program enrollment). These steps were repeated and included regular discussion among the primary qualitative team to verify the validity and credibility of findings to reach consensus.

Results

We completed eleven (n=11) individual interviews with program participants. One respondent (n=1) was not a PCP, and their data were excluded from the analysis. Ten respondents (n=10) included physicians (3 male, 7 female) from rural and urban spoke sites (3 rural, 7 urban). We facilitated three focus groups, all were a gender-mixed composition of five to eight respondents from rural and urban spoke sites. The final data analyses included the aggregated findings from individual PCP interviews (n=10) and focus group data.

Five main findings are presented, reporting PCPs’ perspectives on how VA-ECHO facilitated workforce development, how providers’ training needs and expectations were met, how the training improved providers’ knowledge and skills, and the ways in which barriers and facilitators to program participation and voluntary program enrollment influenced participants’ experience.

VA-ECHO Facilitates Workforce Development on System Level

Most respondents reported that the ECHO-based training and education of providers could help them improve care delivered to patients on a healthcare-system level, supporting the definition of workforce development (Table 3 quotation (Q1)).

Facilitating Practice Changes to Improve Workforce Development on an Individual Level

Meeting Providers’ Training Expectations and Needs. Respondents reported wanting to learn to improve conversations with their patients about tapering medications and alternative pain care

Table 2. Domain Matrix.

Domain	Definition
Acknowledgement of Pain ^{18,21}	Importance of PCP finding evidence for pain rather than having doubt.
Barriers to Pain Management ²²	Any barrier mentioned including inadequate access to care services, poor care coordination, conflicting management approaches from multiple providers, and disability claims process
Facilitators to Pain Management ²²	Any facilitator mentioned including social support, positive affirmations, goal setting
Patient-Provider Communication ¹⁸	Discussions regarding coping strategies, new prescriptions and pain management care
Patient-Provider Relationship ^{19,21}	Trust and rapport building between provider and patient with chronic pain
Provider Perspective on Pain Care ^{5,6,9,18,19}	Provider views on pain management care
Provider Perspective on VA-ECHO program ¹¹	Provider views on VA-ECHO program
Alternative Care ^{23,24}	Non-medication strategies for pain management Examples: exercise, cognitive coping, religious activities, and activity restriction, CAM
Opioid Prescription ²¹	Use of analgesics medications for pain management
Other Medications ⁹	Medications other than opioids that may have been used to manage chronic pain
Other Types of Care	Any other types of pain care, procedures, testing mentioned to treat pain
Questions	Are there things that are still not clear. Any questions that they may still have.
VA-ECHO Topics ^{10,11}	Topics discussed in VA-ECHO program

Table 3. Supporting Quotations for Findings.

Finding	Representative quotation (Q)
VA-ECHO facilitates Workforce Development on System level	1. <i>I think in the broadest sense it [VA-ECHO] has the opportunity to impact quality of care ... the more skilled provider knowledge, we're going to hopefully use that to provide better care. I think it has the potential to provide efficiencies to care. Because I think the better we are ... at assessing individual's pain and identifying the appropriate treatments, the more efficient we will be at delivering those treatments in an efficacious way. And when we're doing that consistently then we can build our health care system so we have the right amount of resources and the right amount of space because we're getting all the people to the place they should be, when they should be there. (Urban VAMC interview)</i>
Meeting providers' training expectations and needs	2. <i>I started class right at the time a lot of this opioid stuff was coming to head. One of the biggest things that [Hub Specialist] was good about was or what we learned was how to have the conversation about using narcotics chronically, or using them for chronic pain, and why that doesn't work well. You know, trying to have that conversation with your patient, about the pitfalls of that, what other things they can do, why they need to work to help themselves. [...] And then again having that conversation with them about why that isn't the answer how to start to take people off these or wean off as appropriate. So that was probably the biggest thing I think we all, well most the people I've talked to found helpful. (Urban CBOC interview)</i> 3. <i>I just think it's having a case presented that's very representative of the things I see and do every day. And helping me to instead of dread particular visits, it gives me a new idea on how to approach it differently. (Urban CBOC interview)</i>
Improving providers' pain management knowledge and skills	4. <i>I noticed just changes in prescribing patterns in the physicians that participated, I noticed the referrals to pain management more appropriate, some patients had more of a workup, the providers were actually trying to figure out the etiology of their pain before sending them somewhere. They [patients] wound up going to the more appropriate specialist. (Rural VAMC interview)</i> 5. <i>I would say that it [participating in VA-ECHO] has made me more confident. And especially in regards to not prescribing opiates. I think I'm more confident in medically making the decision to not do that, and then in my ability to discuss with the patient why I'm not doing that and what other alternatives exist. (Post-Participation Focus Group)</i>
Reported barriers and Challenges to program participation	6. <i>... I think it's a pretty, it's a big-time commitment ... we don't have that sort of time commitment for continuing educations. So that's a barrier to try and protect that time every week. (Rural VAMC interview)</i>
Reported facilitators to program participation	7. <i>My supervisor intentionally blocked my schedule so that I could participate in the program. Or else I honestly would have no clue that it even existed ... (Urban CBOC interview)</i>
Emergent Finding: Voluntary program enrollment influences participant experience	8. <i>I was fortunate enough to meet [Hub Specialist] at a pain conference I attended. [...] when an opportunity arose shortly thereafter to join in their Pain [VA-ECHO] program I convinced my boss, the chief of staff, that we needed to do it and we needed to dedicate the time for a certain number of primary care doctors to just try and help us change the culture here. (Urban VAMC Interview)</i> 9. <i>... I think I got chosen. Through the pharmacy opioid review board or whatever. So, I think there were a few of us who were sort of hand chosen to participate in the VA-ECHO. And of course, my immediate response, [...], was one more of punitive, you know why was I chosen and what problems are you all not telling us about? So I sort of took that angle and in a roundabout way I was encouraged that I was sort of chosen that way, [...] I don't know.[...] [Hub site] can really get very focused on the opiates and not necessarily give as much information and help on the other side and that's an area that I would like to see done a little bit better (Urban CBOC Interview)</i>

strategies. Many respondents were satisfied with the breadth of topics presented, but some respondents felt the program was too focused on minimizing opioid prescribing and that there were some missing topics (e.g. pain management for geriatric patients, hospice, and palliative care) reflective of the respondents' individual patient populations (Q2). Many respondents identified case presentations as valuable and helpful for understanding complex patients representative of their patient panel (Q3).

Improving Providers' Pain Management Knowledge and Skills. Most respondents reported improved knowledge and abilities to deliver pain care (Q4). Many respondents described making more appropriate referrals, reducing new and tapering existing opioid prescriptions (Q5).

Barriers, Challenges, and Facilitators to Program Participation

Providers described barriers, challenges, and facilitators to participating in VA-ECHO. Having limited time for participation and scheduling conflicts with patient care was a challenge for some but could also be a barrier to participation (Q6).

Supervisory support for flexibility in making their schedule and having supervisors "block time off," and obtaining "administrative support" and "buy-in" from Chief of Staff were essential facilitators for respondents participating in the program (Q7).

Voluntary Program Enrollment Influences Participant Experience. Respondents reported being recruited to participate in the program in various ways. Some learned about the program at a pain conference, some received emails from administrators asking about their interest in the program, and others were directed to participate by their organization's leadership (Q8). Many respondents participated in the program based on their own learning objectives, eg, to learn about pain management options and resources; Others wished to change the culture of pain management at their site.

Although most respondents reported positive experiences with the program. Providers' perception of whether their participation was voluntary influenced their overall program experience. Those who volunteered to enroll in the program emphasized their satisfaction with the program and reported little to no complaints about the program itself. Some respondents who were required to participate by their supervisors, or perceived that participation was mandatory due to performance issues (eg opioid prescribing rates) discussed more criticisms of the program (Q9).

Discussion

The objective of this analysis was to describe PCPs' experiences participating in VA-ECHO and how this program contributed to their workforce development for pain management care. Providers perceived their knowledge and skills improved through participating in the program. Respondents who volunteered to participate in the program expressed more positive

experiences with the program. Limited time and scheduling constraints were reported as the main barriers to participation, and administrative support was essential to overcome this barrier.

Previous remote training and mentoring program studies have focused on improving relevant patient and provider outcomes.⁹ Using an interprofessional training model similar to VA-ECHO is an effective approach for pain care.^{4,10-14} Our work extends our understanding of program participants' experiences with VA-ECHO and provides evidence supporting how this program fulfilled participants' workforce development needs. The ECHO model presents opportunities for workforce development in large, complex healthcare systems, and there is support for this training model to be used as an effective approach for promoting workforce development for providers treating opioid use disorders.⁹

Pain management care for geriatric, palliative, and hospice patients was an unmet training need identified by some respondents based on their individual patient populations. Overall, most providers reported that VA-ECHO program provided knowledge and skills necessary for reducing opioid prescribing, making more appropriate referrals for pain management care, and improved the quality of care they delivered. These findings align with another study's evaluation of Project ECHO for substance use disorders⁹ to promote workforce development which found that providers experienced increased self-efficacy and overall improvement of their knowledge. Our study of VA providers identified similar findings, supporting the use of VA-ECHO as a strategy for to address the shortage of pain management care services in remote and underserved areas.⁵

An emergent finding from this analysis was that for some participants, volunteering versus required participation may influence their experience of the program. This was important for workforce development as it suggested that allowing participants to volunteer to participate may foster positive experiences for participants. The time commitment required for participation in VA-ECHO may conflict with meeting performance metrics focused on seeing more patients and increasing access and may deter or prevent participation.²¹ Reduced clinic time was found to be the main barrier to participation in another study.⁹ These competing demands of mandated participant enrollment and reduced clinic time impact workforce development and have implications for organizational assessment of performance measures and their prioritization.²⁵ Program participant engagement strategies should be examined to garner buy-in and address barriers to participation.

Limitations

The findings may not be representative of all VA-ECHO programs which span a range of specialties and program participants and may not be generalizable to non-VHA providers. Given that this work was a secondary analysis and individual demographics were not initially collected, we were not able to identify individual respondents and thus participant-level analysis was limited. We did not interview providers who

chose not to participate in the program. Thus, there may be more we do not understand about barriers to program participation and workforce development needs. Also, the small number of rural respondents limited analysis of factors unique to rural settings.

Strengths

Strengths of this analysis include that the analysis was conducted with the original data set and with members of the primary evaluation team involved in the original data collection and analyses¹⁴ and prior evaluations of pain management VA-ECHO.^{10–13} Although our overall respondent numbers were limited, our data were sufficient in quality and quantity due to the narrow evaluation scope, purposive sample, rich quality data collected through the methods employed, and analysis approach support substantive data saturation to generate informative, meaningful findings.²⁵

Future Directions

Future directions for the program could include expanding the program curriculum to address the pain management needs of geriatric, palliative, and hospice care. Additional studies are necessary to determine the program's impact on rural populations.⁹ Future studies should incorporate mixed-methods to measure the effectiveness of VA-ECHO training for reducing opioid prescribing and impact on other patient care outcomes.²⁶

Conclusions

Most respondents reported that VA-ECHO supported their professional development for delivering pain management care. Providers experienced knowledge (eg alternative care approaches) and skills (eg communicating treatment options with patients) improvements through program participation. Limited time and scheduling constraints were reported as the main barriers to participation, and administrative support (eg scheduling flexibility and supervisor buy-in) was essential to overcome this barrier. Although providers described challenges to participation and some unmet training needs, overall, the respondents felt that participation in the VA-ECHO program improved their practice and increased their confidence in providing pain care. These findings support that VA-ECHO contributed to their workforce development for pain management care.

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Author Contributions

SS, KS, LS, and SB contributed to the study design, data collection, data analysis and writing the manuscript. DA, MH and DCA were primarily responsible for the design of the larger evaluation of the

SCAN-ECHO program and contributed to the writing of this manuscript.


Declaration of Conflicting Interests

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References

1. Yong RJ, Mullins PM, Bhattacharyya N. Prevalence of chronic pain among adults in the United States. *Pain*. 2021. doi: 10.1097/j.pain.0000000000002291. Epub ahead of print. PMID: 33990113.
2. Nahin RL. Severe pain in veterans: the effect of age and sex, and comparisons with the general population. *J Pain*. 2017;18(3):247-254. doi:10.1016/j.jpain.2016.10.021.
3. Lin L, Peltzman T, McCarthy J, Oliva E, Trafton J, Bohnert A. Changing trends in opioid overdose deaths and prescription opioid receipt among veterans. *Am J Prev Med*. 2019;57(1):106-110. doi:10.1016/j.amepre.2019.01.016.
4. Hassan S, Carlin L, Zhao J, Taenzer P, Furlan A. Promoting an inter-professional approach to chronic pain management in primary care using project ECHO. *J Interprof Care*. 2021;35(3):464-467. DOI: 10.1080/13561820.2020.1733502.
5. Lund B, Ohl M, Hadlandsmyth K, Mosher H. Regional and rural-urban variation in opioid prescribing in the veterans health administration. *Mil Med*. 2019;184(11-12):894-900. doi:10.1093/milmed/usz104.
6. Dobscha S, Morasco B, Duckart J, Macey T, Deyo R. Correlates of prescription opioid initiation and long-term opioid use in veterans with persistent pain. *Clin J Pain*. 2013;29(2):102-108. doi:10.1097/ajp.0b013e3182490bdb.
7. Jacobs R. Human resource development and the emergence of workforce development. *Adv Dev Hum Resour*. 2000;2(3):65-69. doi:10.1177/152342230000200310.
8. Devonshire E, Nicholas M. Continuing education in pain management. *Pain Rep*. 2018;3(5):e688. doi:10.1097/pr9.00000000000010688.
9. Holmes CM, Keyser-Marcus L, Dave B, et al. Project ECHO and opioid education: a systematic review. *Curr Treat Options Psych*. 2020;7:9-22. <https://doi.org/10.1007/s40501-020-00199-8>.
10. Carey EP, Frank JW, Kerns RD, Ho PM, Kirsh SR. Implementation of telementoring for pain management in veterans health administration: spatial analysis. *J Rehabil Res Dev*. 2016;53(1):147-156. doi: 10.1682/JRRD.2014.10.0247. PMID: 26934696.
11. Ball S, Wilson B, Ober S, Mchaourab A. SCAN-ECHO for pain management: Implementing a regional telementoring training for primary care providers. *Pain Med*. 2017;19(2):262-268. doi:10.1093/pm/pnx122.

12. Frank J, Carey E, Fagan K, et al. Evaluation of a telementoring intervention for pain management in the veterans health administration. *Pain Med.* 2015;16(6):1090-1100. doi:10.1111/pme.12715.
13. Stevenson L, Ball S, Haverhals L, Aron D, Lowery J. Evaluation of a national telemedicine initiative in the veterans health administration: Factors associated with successful implementation. *J Telemed Telecare.* 2016;24(3):168-178. doi:10.1177/1357633x16677676.
14. Ball S, Stryczek K, Stevenson L, et al. A qualitative evaluation of the pain management VA-ECHO program using the RE-AIM framework: The participant's perspective. *Front Public Health.* 2020;8:169. doi:10.3389/fpubh.2020.00169.
15. Hamilton AB, Finley EP. Qualitative methods in implementation research: an introduction. *Psychiatry Res.* 2019;280:112516. doi:10.1016/j.psychres.2019.112516.
16. Veterans Health Administration. *VHA operations activities that may constitute research, VHA Handbook 1058.05.* U.S. Department of Veterans Affairs; 2011.
17. Averill JB. Matrix analysis as a complementary analytic strategy in qualitative inquiry. *Qual Health Res.* 2002;12(6):855-866.
18. Bergman A, Matthias M, Coffing J, Krebs E. Contrasting tensions between patients and PCPs in chronic pain management: a qualitative study: Table 1. *Pain Med.* 2013;14(11):1689-1697. doi:10.1111/pme.12172.
19. Simmonds M, Finley E, Vale S, Pugh M, Turner B. A qualitative study of veterans on long-term opioid analgesics: Barriers and facilitators to multimodality pain management. *Pain Med.* 2015;16(4):726-732. doi:10.1111/pme.12626.
20. Hawkins E, Malte C, Hagedorn H, et al. Survey of primary care and mental health prescribers' perspectives on reducing opioid and benzodiazepine co-prescribing among veterans. *Pain Med.* 2016;pnw140. doi:10.1093/pm/pnw140.
21. Elo S, Kääriäinen M, Kanste O, Pölkki T, Utriainen K, Kyngäs H. Qualitative content analysis. *Sage Open.* 2014;4(1):215824401452263. doi:10.1177/2158244014522633.
22. Thom B, Duke K, Herring R. Workforce development: is there a paradigm shift? *Drugs: Education, Prevention and Policy.* 2017;24(6):427-429. DOI: 10.1080/09687637.2017.1385725.
23. Matthias MS, Krebs EE, Berman AA, Coffing JM, Bair MJ. Communicating about opioids for chronic pain: a qualitative study of patient attributions and the influence of the patient-physician relationship. *Eur J Pain.* 2014;18:835-843. doi:10.1002/j.1532-2149.2013.00426.x
24. Barry LC, Kerns RD, Guo Z, Duong BD, Iannone LP, Reid MC. Identification of strategies used to cope with chronic pain in older persons receiving primary care from a veterans affairs medical center. *J Am Geriatr Soc.* 2004;52:950-956.
25. Malterud K, Siersma VD, Guassora AD. Sample size in qualitative interview studies: guided by information power. *Qual Health Res.* 2016;26(13):1753-1760. doi:10.1177/1049732315617444.
26. Fischer SH, Rose AJ, McBain RK, Faherty LJ, Sousa JL, Martineau M. *Evaluation of Technology-Enabled Collaborative Learning and Capacity Building Models: Materials for a Report to Congress.* RAND Corporation; 2019. https://www.rand.org/pubs/research_reports/RR2934.html.

Appendix I: Interview and Focus Group Guides

Staff interview and focus group example semi-structured questions and probes.

Generic prompts: If responses are limited or require clarification, probes may be used to illicit more detailed responses. Probes should use words or phrases presented by the participant using one of the following formats:

What do you mean by ... ?

Can you tell me more about ...?

Can you give me an example of ...?

Can you tell me about a time when ... ?

1.1 Individual Interview Guide

- Please tell me about your role.
- Tell me about your experience with providing pain management care to your patients
- [Past Participants / Decliners] Are you familiar with or have you ever heard of SCAN-ECHO or VA-ECHO for Pain?

[Probe as appropriate using grounded prompts. If answered NO, skip to DECLINER questions]

- Tell me about your experience as a participant in the SCAN-ECHO Pain management program.
[if needed] Have you presented one of your cases for Pain SCAN-ECHO?

[if needed] Before participating in Pain SCAN-ECHO cases how would you get feedback?

[if needed] Who would you refer to? What other resources have you used?

- What has facilitated your ability to attend Pain SCAN-ECHO when you wanted to?

Probe: support and resources

Probe: barriers and/or reasons why you couldn't attend when you wanted to?

- What specific aspects of the program's format were particularly important to successful learning?
- Are there specific areas / topics of pain management that have been most valuable?

[if needed] Are there topics or areas that you wish Pain SCAN-ECHO addressed but didn't?

[if needed] What would you change about the Pain SCAN-ECHO program?

- In what ways, if any, have you incorporated information from SCAN-ECHO into your practice?

[if needed] In what ways your practice changed as a result of Pain SCAN-ECHO?

[if needed] To what extent have you shared your knowledge and experiences of the Pain SCAN-ECHO program with others (other PCPs)?

[if needed] Are you comfortable with these changes?

- In what ways, if any, has Pain SCAN-ECHO impacted care for your patients?

[if needed] What specific pain management practices have you adopted or adapted?

[if needed] How or to what extent has Pain SCAN-ECHO affected access? Quality of care?

- Has there been anything unexpected or surprising from Pain SCAN-ECHO?
- Do you plan to continue attending the SCAN-ECHO program?

[If no] what are the barriers / reasons you don't?

- Is there anything else you think would be valuable for us to know?

[DECLINERS/ NON-PARTICIPANTS]

- Do you recall ever being contacted about participating in the VA-SCAN-ECHO program? Or did you ever reach out to inquire about a VA-SCAN-ECHO program for pain management?
 - *[Probe reason for decline or inability to attend if given]*
- Is there anything that would help you participate in VA SCAN-ECHO?
- Tell me about the access to pain management care for your patients.
 - *Probe:* If/when needed, how do you get feedback on pain cases?
 - *Probe:* Who do you refer to?
 - *Probe:* What other resources have you used?
- Do you have any questions for us or is there anything we haven't asked about that you think we should know?

1.2 Pre-participation Focus Group

- Tell me about your experience with providing pain management care to your patients.
- How do you feel about the VA-ECHO platform as a means for learning about pain management in primary care?
 - (a) What is your impression of the goals of this program?
- In what ways do you think this program can improve the care you provide?
- What concerns, if any, do you have about participating in this program?
 - (a) What could be done to address these concerns?
- Tell us how you learned about the Pain VA-ECHO program and how you decided to participate.
- What has facilitated your enrollment in this program at your facility?

1.3 Post-participation Focus Group

- Tell me about your experiences as a participant in [VA-ECHO] for pain.
- How do you feel about the VA-ECHO platform as a means for learning about pain management in primary care?
- To what extent was the content of the program relevant to your practice?
- In what ways, if any, do you think this program has changed the care you provide?
- What concerns, if any, do you have about participating in this program?
 - (a) What could be done to address these concerns?
- What has facilitated your participation in this program at your facility?
- What has been a barrier to your participation in this program?
- Do you have any additional concerns or comments?

Author Biographies

Soumya Subramaniam, MPH, is a Research Health Science Specialist at the VA Northeast Ohio Healthcare System. She specializes in qualitative research methods and research coordination for program evaluation, health services and quality improvement research.

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Lauren Stevenson holds a Doctor of Philosophy degree in social welfare from Case Western Reserve University, Cleveland, OH. Her research and evaluation interests include telehealth implementation and chronic illness management including pain management. Dr. Stevenson is a Research Health Science Specialist for the VA Northeast Ohio Healthcare System and a part of The VA Collaborative Evaluation Center (VACE), a virtual center based at the Rocky Mountain Regional, Seattle, and Louis Stokes Cleveland VA Medical Centers.

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