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Development and pilot testing a communication simulation training for interpreters to improve pain communication between primary care providers and patients with limited English proficiency

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ABSTRACT

Context: Health disparities in patients with limited English proficiency are worsened due to scarcity of interpreter-focused communication interventions and trainings.
Objectives: To develop a high-fidelity simulation training for interpreters to use a novel pain communication tool, i.e., Pain Assessment Information Visualization (InfoViz) Tool, and evaluate interpreters' implementation fidelity during a pilot study.
Methods: This research methodology study involved training interpreters through high-fidelity simulations and assessing the implementation fidelity of 20 patient-provider visits in primary care clinics. Descriptive statistics were calculated for the assessment and fidelity. Debriefing interviews were conducted after the training and at the study completion. These were transcribed and analyzed using thematic analysis.
Results: Four interpreters completed training, requesting an average of 2.5 practice simulation studies prior to assessment (M = 54 min, score: M = 95%). Interviews revealed two themes: positive experiences and suggestions for improvement. Interpreters averaged 83% for implementation fidelity for the 20 visits. Post-study interviews revealed positive experiences and the need for refresher training.
Conclusion: The communication simulation training for interpreters is feasible, acceptable, and can ensure accurate use of the Pain InfoViz Tool during provider-patient communication.
Innovation: We applied a InfoViz Tool in pain simulations and extended high-fidelity training to medical interpreting.

1. Introduction

Pain is a major public health challenge in the United States (U.S. [1]), affecting 20.4% of Americans [2]. Adequate pain management requires effective patient-provider communication about pain. Yet, communication can be challenging due to the complexity of the pain, and cultural and language barriers, especially for those with limited English proficiency (LEP). Interpreters are essential for bridging these communication gaps with the 25 million LEP patients [3]. However, some LEP patient groups, such as the Hmong population, experience poor quality of interpretation due to cultural and generational differences in communication [4-6].

Studies suggest that LEP Hmong patients, interpreters, and providers have difficulty understanding each other due to Hmong patients' use of pain metaphors, which are incompatible with the language and culture of interpreters and providers [5,7,8]. This impairs providers' ability to diagnose and manage pain [5]. Communication interventions are often used to increase mutual understanding between a patient and clinician, and thus to improve patient outcomes [9,10]. However, no research has explored pain communication interventions for triadic communication between patients, interpreters, and providers, leaving no insight on how to effectively train interpreters.

Simulations have the potential to enhance interpreter communication training, as they provide an experiential learning process [11] to mimic the real-world clinical scenarios and are designed to demonstrate procedures, decision-making, and critical thinking through techniques such as role-playing and videos. Simulations have been used in the healthcare fields including nursing and medicine over the past six

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decades [12,13], and can be tailored to different levels of fidelity or realism. High-fidelity simulations engage learners in all aspects of skills such as listening, observing, and synthesizing what they hear, and feel while linking these skills to the relevant theoretical concepts [14]. Studies have shown positive outcomes from simulations, such as increased knowledge, satisfaction, and confidence in learners [15]. However, no pain communication intervention studies have incorporated simulation training for interpreters.

To address the communication gap, we created a Pain Assessment Information Visualization (InfoViz) Tool to facilitate the triadic communication of LEP Hmong patients experiencing pain, interpreters, and providers [16,17]. From now on, we will refer to the Pain Assessment InfoViz Tool as the Pain InfoViz Tool. The Pain InfoViz Tool is a 3-copy carbon paper comprised of culturally appropriate pain location body map and 13 pain quality infographics that map providers' language for pain quality to the metaphors used by the Hmong, along with six severity faces (see Fig. 1). The study's purposes were to develop a communication simulation training program for interpreters to increase their skills and knowledge in using the Pain InfoViz Tool, create an implementation fidelity checklist to assess their usage of the Pain InfoViz Tool, and evaluate their implementation fidelity during a pilot study of the Pain InfoViz Tool in primary care settings. Implementation fidelity refers to the accuracy and competence of the treatment [18–21]. Strategies to ensure fidelity include evaluating adherence to protocols using fidelity checks such (e.g., audio/videotaping) [22], competence assessment (e.g., checklists and/or rating scales) [19,20], and tracking implementation content (e.g., regular meetings) [23,24].

2. Methods

This study was approved by the Minimal Risk Research International Review Board at the University of Wisconsin.

2.1. Design

This research methodology study involved training interpreters through high-fidelity simulations and assessing the impact of the training (i.e., implementation fidelity of the Pain InfoViz Tool) in primary care clinics during a pilot study.

The pilot study used a static group comparison design, collecting data from 20 LEP Hmong patient–interpreter–provider triads under the usual care "control" condition (i.e., interpreters using verbal pain descriptions), followed by data collection from another 20 triads under the "intervention" condition (i.e., interpreters using verbal pain descriptions and the InfoViz Tool). For the purpose of this study, the data reported were part of the intervention condition.

2.2. Settings

This study commenced at the university campus for medical interpreter training and subsequently extended to primary care clinics within a large academic health system in the Midwest for the pilot study to assess implementation fidelity of the training. At this large academic health system's primary care clinics, pain was historically treated as a vital sign and routinely asked during every visit, using a numerical pain

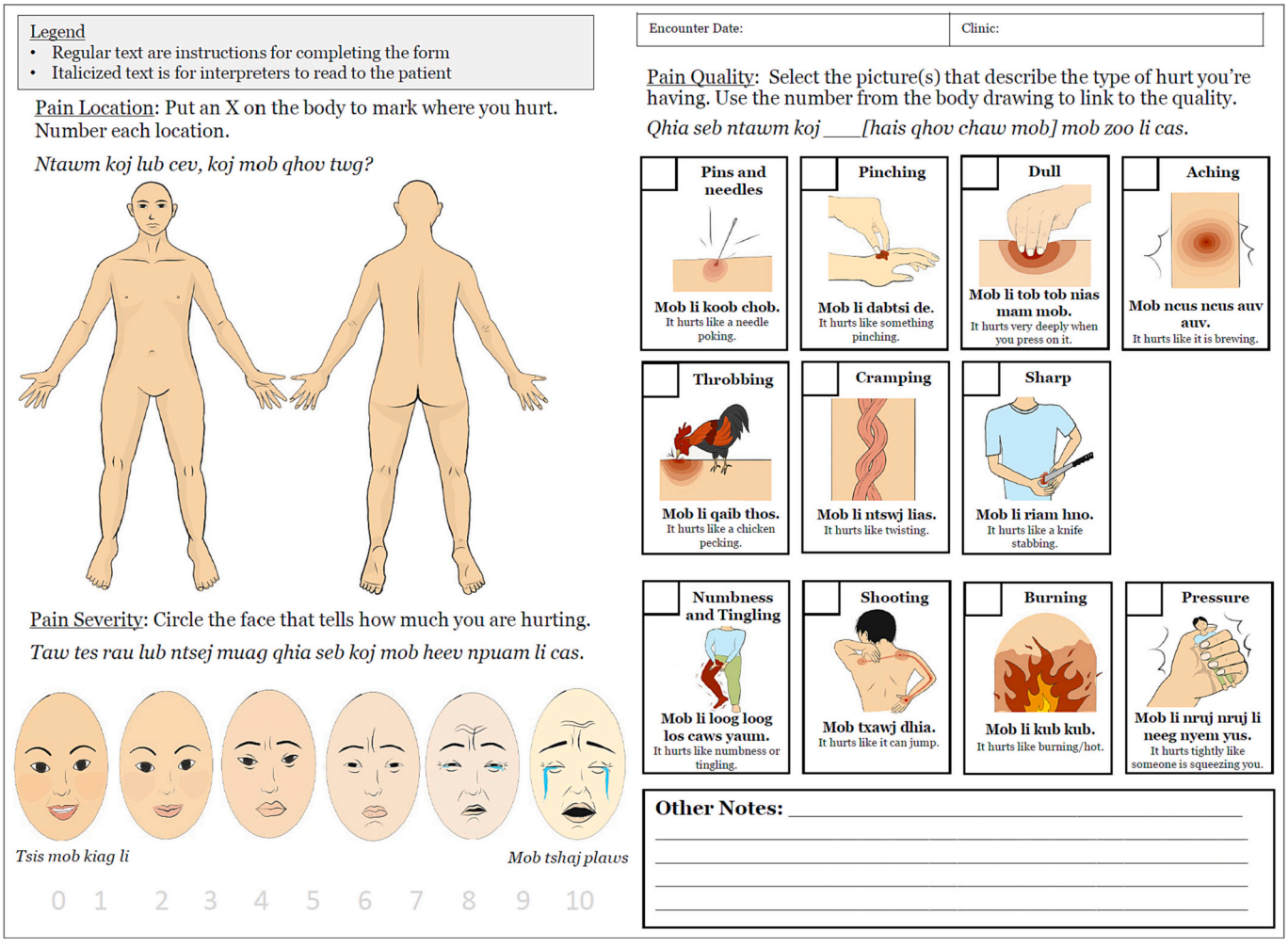

Fig. 1. Pain Assessment Information Visualization Tool.

severity scale ranging from 0 to 10. However, at these clinics, this practice has evolved. Presently, pain assessment typically occurs when a provider (e.g., physician or Advanced Practice Provider) deems it relevant within the context of a visit specifically related to a pain complaint. Pain is no longer routinely assessed during visits unrelated to pain complaints, such as physical examinations. For this study, we only focused on pain complaints.

2.3. Sample and recruitment

During clinic visits, when a LEP patient identifies their primary language as non-English (e.g., Hmong), the electronic health record system automatically triggers an automatic notification for an interpreter to assist the patient. The Interpreter Services Department ensures that the LEP patient is provided with an interpreter for their visit. Interpreters were eligible if they identified as a Hmong-speaking medical interpreter. We invited Hmong-speaking interpreters from the Interpreter Services Department. After receiving our flyer and information sheet, interested interpreters contacted the study team. The planned process for participation was reviewed (Fig. 2), all questions were answered, and those with continued interest in participating were consented.

2.4. Phase I: development of communication training materials for interpreters

The purpose of the communication simulation training was to equip the interpreters with the knowledge and skill to utilize the Pain InfoViz Tool, including completing it with Hmong patients, and interpreting the pain metaphors, pain location(s), and pain severity information from Hmong-speaking patients to English-speaking providers during the clinic visit. In the following section, we described the training materials.

2.4.1. Study background

We developed an instruction manual that outlined (a) the goals of the study, (b) the agenda, (c) necessary steps to follow when using the tool, (d) common pitfalls of the use of the tool and coaching strategies, and (e) the PowerPoint presentation. The PowerPoint presentation included content on the background of the study and outlined the materials in the manual.

2.4.2. Communication simulation

To develop the simulation materials, we followed Jeffries (2005)'s framework [22] for designing, implementing, and evaluating simulations. To ensure that the interpreters understand and obtain the skills needed to successfully use the Pain InfoViz Tool, we developed two primary materials for the simulation: an 8-min video and case studies.

First, we created an 8-min video to demonstrate how to use the Pain InfoViz Tool by a triad of a standardized Hmong patient, an interpreter, and a provider, in a clinic visit. The video included how to elicit and document pain severity, pain location, and pain quality information; and how to communicate the information regarding severity, location, and quality of pain to the provider, using the appropriate provider medical terminology. We prepared scripts for a standardized Hmong patient, interpreter and provider focused on a foot pain experience, with Hmong and English descriptions of varying pain characteristics. Three bilingual Hmong doctoral students from the University played the roles of standardized personnel. The script was sent to them to review one week ahead of time. After this, they practiced their roles for two hours with feedback from the Principal Investigator (PI) in the University's Nursing Skills and Simulation Lab. When they were comfortable, the session was then recorded using a camera mounted in the corner of the ceiling of the simulated clinic room. This video was shown during the training.

Second, case studies were developed for the standardized patients and providers to use in assisting the interpreters with using and practicing the Pain InfoViz Tool and with the final assessment of using the tool during a simulated clinic visit with the standardized patient and provider. We created seven case studies with varying level of difficulty—easy (one pain location and one quality), moderate (two or three locations and qualities), and difficult (two or three locations with one non-specific location; one or two qualities not listed; type or description of pain not matching the tool).

2.4.3. Reference

A 5 × 8 laminated pocket card was created with content to remind interpreters of strategies they should consider when using the Pain InfoViz Tool, including suggested responses to use in situations where the patients rely on the interpreter to answer the tool (see Fig. 3). The purpose of the pocket card was to be a quick reference tool to use during clinic visits, promoting implementation fidelity.

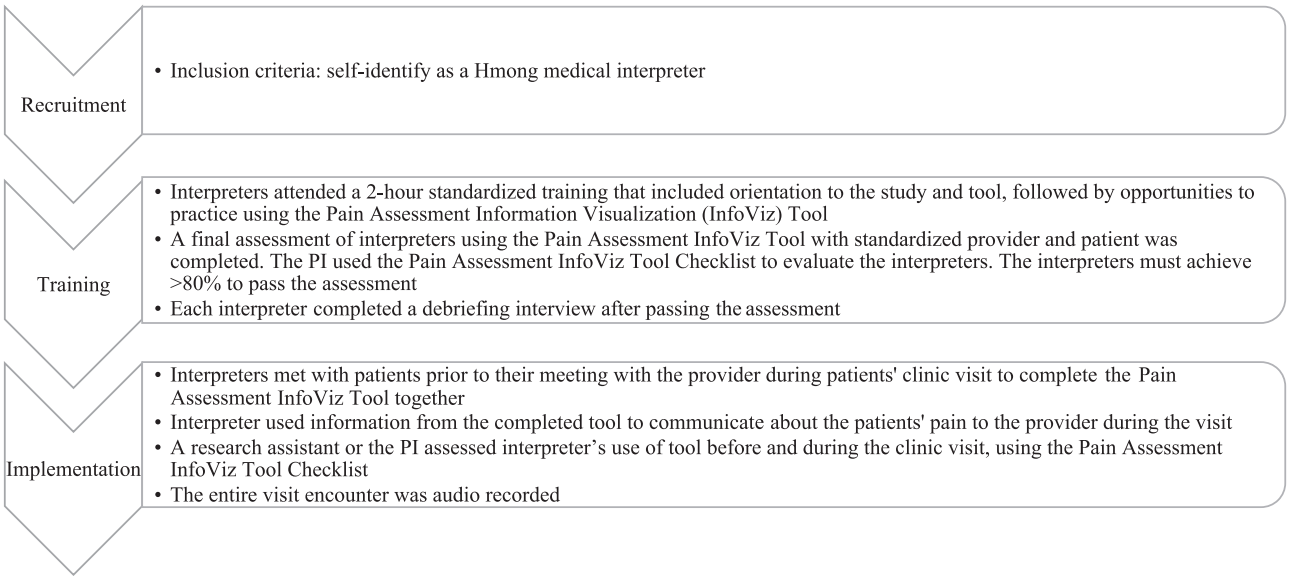

Fig. 2. A process diagram outlining the recruitment, training, and implementation.

POCKETCARD

Avoid	Strategy
Narrow down the patient's response to one domain without confirming with the patient what the response is	Read the question exactly as it is in its translation
Omit one or more response categories when reading the question	Read all responses exactly as it is in its translation
Select response for the patient because the patient couldn't pick or doesn't provide an answer, or the interpreter cannot translate to patient	Do not provide a response for the patient when the patient inquires and asked the patient to confirm the selected answers
Replace the word for the original concept with a different word in the native language	Read the question exactly as it is in its translation
Translate question using meaning or concept different from the original	Read the question exactly as it is in its translation

POCKETCARD

Patient Inquire Example	Response Strategy
Effective communication with a talkative patient	"I want to reconfirm with you your responses. You are hurting ___[state the location]. At this location, you describe your pain as [state the qualities]. Lastly, you said you are hurting at a [state the faces]"
Patient provides an answer before you read all of the responses.	"Okay, I can jot that down but let me read all the responses before you provide an answer. I will reconfirm your response with you afterward."
"I don't know which one to pick." "Can you just answer it for me?"	"I am unable to provide a response for you. It is important you share what you feel. If you need more time, please let me know. If you would like me to repeat, please let me know."
"I don't understand what you are asking."	"Okay, let me re-read the question and response options again."

Pain Definitions

- Pain Quality: patient use words to describe the pain
- Pain Severity: patient grade the intensity of pain
- Pain Location: patient identifies where the pain is located

Fig. 3.. Pocket card with content to remind interpreter of strategies they should consider when using the Pain Assessment InfoViz Tool.

2.4.4. *Pain infoviz tool checklist*

The PI created the Pain InfoViz Tool Checklist to assess the interpreters' skills during simulated sessions and during the pilot study at the clinics. The Pain InfoViz Tool Checklist (Fig. 4) has Yes/No responses for three assessment components: 1) interpreter communication during tool completion in the waiting area, 2) completeness of the tool form, and 3) interpreter communication of pain information with the provider during the visit.

2.5. *Phase II: training of the Interpreters*

2.5.1. *Setting*

Interpreters were invited to the University campus for training in April–May 2022.

2.5.2. *Training procedures*

The training had two parts. In the first part, which lasted 30 min, the PI delivered the PowerPoint presentation and introduced the training materials, the interpreters watched the 8-min video, and all questions were answered in the PI's research lab.

The second part of the training was the simulation which involved the interpreters practicing the skills they learned in the first part of training using the Pain InfoViz Tool with a standardized LEP Hmong patient and provider in the Nursing Skills and Simulation Lab. The standardized patient was either a Hmong community member or a research assistant (RA) proficient in speaking Hmong, while the provider was either a Hmong medical student or a Doctor of Nursing Practice student. The standardized patient, standardized provider, and PI met one hour prior to the interpreter's training to review roles, expectations, and case studies, and practice together. During the simulation, only the interpreter, standardized patient, and standardized provider were in the clinic simulation room, while the PI and a team member monitored and assessed the interpreter's performance using the Pain InfoViz Tool Checklist from the control room. The PI provided strategies for improvement after each case study. Interpreters practiced as many case studies as needed to feel comfortable before taking the final assessment.

The goal of the final assessment was to assess whether the interpreter could demonstrate accurate use of the Pain InfoViz Tool before they use it at the clinic. We defined accurate use of the Pain InfoViz Tool as achieving 80% or higher on the Checklist —a threshold used in studies that train clinicians to implement patient-provider communication tools [23,24]. Interpreters who did not reach this threshold received additional training until the threshold was met.

Following the completion of the training assessment, the PI debriefed with interpreters to gain insights into their training experience, including challenges, session length, and improvement suggestions (see Appendix for example questions). Debriefing interviews were conducted in person with the interpreter immediately after the training session and were audio recording. Interpreters were compensated $50 per hour for their time.

2.6. *Phase III: pilot study to assess implementation fidelity*

Three bilingual Hmong RAs were trained by the PI to assess the interpreter's performance with the Pain InfoViz Tool at the clinic visits. The RAs' training comprised of watching the recorded interpreter practice sessions and using the Pain InfoViz Tool Checklist to score interpreters' performance. To be ready for a clinic visit, the RA had to accurately match the PI's Checklist (standard) with 80% correctness.

After this training, the RAs attended patient visits at the clinic and observed the interpreter's use of the Pain InfoViz Tool using the Checklist. With COVID-19 restrictions, interpreter and patient used the Pain InfoViz Tool in a private clinic room before meeting provider. When restrictions eased, they completed the tool in the waiting area. The RAs also audio-recorded the entire visit and re-listened to the

Completion of Pain Assessment InfoViz Tool Checklist

Yes/No	Interpreter Communication During Tool Completion in Waiting Area	Comments
Yes/No	Ask the patient for their preference in completing the form—e.g., patient complete vs interpreter	
Yes/No	Read the written italicized Hmong text exactly as it is to the patient to elicit pain location(s).	
Yes/No	Read the written italicized Hmong text exactly as it is to elicit pain quality.	
Yes/No	Read all pain quality items to the patient while pointing to images on the tool.	
Yes/ No	Did not omit one or more pain quality options when reading the question to the patient	
Yes/No	Read the written italicized Hmong text exactly as it is to the patient to elicit pain severity.	
Yes/No	Ask if there is anything else the patient would like to share with the provider and write it down in the text box	
Yes/No	Did not provide a response for the patient when the patient is unable to answer or ask for an answer	
Yes/No	Did not narrow down patient response to one domain without confirming with patient what their response is	
Yes/No	Did not replace word for original concept with a different word in the Hmong language	
Yes/No	Asks patient to confirm response selected	
	Tool Completion Form	
Yes/No	An X was put on the body	
Yes/No	A number was indicated for each location	
Yes/No	Pain quality picture(s) selected and mark with a number	
Yes/No	Face was circled	
	Interpreter Communication of Pain Information During Clinical Encounter	
Yes/No	Gives a copy of the tool to the patient	
Yes/No	Give a copy of the tool to the provider	
Yes/No	Uses the pain location information from the tool to communicate with the provider.	
Yes/No	**Interpreter Communication During Tool Completion in Waiting Area**	**Comments**
Yes/No	Uses the English medical term to communicate pain quality to the provider. For example, if the patient says "It hurts like it is brewing" then the interpreter would interpret "aching" to the provider.	
Yes/No	Uses the pain severity numeric information from the tool to communicate with the provider. For example, if patient says "I hurt in the middle" then the interpreter would interpret "6" to the provider.	
/20	Total Score for Yes	

Fig. 4. Pain Assessment InfoViz Tool Checklist.

recording if they wanted to double check their assessment. The PI also randomly listened to the recordings and double checked the RA's scores.

Following study completion, a team member interviewed the interpreters using their preferred method (telephone or Zoom) to gather their study experience. Semi-structured questions explored their thoughts on the training's usefulness in preparing them to use the Pain InfoViz Tool at the visits and their impression of the study (see Appendix for example questions). All interviews were audio-recorded.

2.7. Strategies to ensure implementation Fidelity

We utilized a range of strategies to monitor implementation fidelity during the study, as recommended by Bellg and colleagues [25]. Examples of strategies used included the use of varied teaching methods to accommodate different learning styles, providing interpreters with the option for multiple practice sessions before assessment, and utilizing a standardized training on the InfoViz Tool (Table 1).

Table 1
Strategies to monitor implementation fidelity in five areas outlined by Bellg et al. (2004).

Areas to monitor Implementation Fidelity	Goal	Pain Assessment Information Visualization (InfoViz) Tool Implementation
Study Design	Ensure same treatment dose within conditions	Each interpreter received same training with case study simulations of varying degree of difficulty, orientation materials, monitoring, and opportunity for feedback.
	Ensure equivalent dose across conditions	All participants used the same Pain Assessment InfoViz Tool at each patient visit.
	Plan for implementation setbacks	Tracked interpreter attrition, responded to interpreter request (e.g., prefer text versus email notification about patient visit).
Training provided	Standardize training	Each interpreter received same training from PI.
	Ensure skill acquisition	Interpreters were monitored, assessed, and received feedback during practice case study simulations. All interpreters had to achieve 80% or better in the final assessment to be deemed competent to use the Pain Assessment InfoViz Tool.
	Minimize drift in skills	Interpreters received an orientation manual and pocket card for reference to use at the patient visit (as needed). The Pain Assessment InfoViz Tool had instructions on it to help the interpreter carry out their task consistently.
	Accommodate differences	Researchers allowed interpreters to practice as many case studies simulations as they desire until they feel comfortable using the tool prior to final assessment. For the interpreters who cannot read Hmong, the PI read the tool aloud in Hmong and had them repeat the information until they felt prepared to participate in the case study simulation. Interpreters participated in a debriefing interview after the training and conclusion of the study.
Delivery of treatment	Control for interpreter differences	A study team member performed fidelity check during the visits. Interpreters were surveyed and interviewed after visit.
	Reduce differences in treatment	All patients, interpreters, and providers used the same the Pain Assessment InfoViz Tool. The tool has the same instructions on the form. Interpreters were given an orientation manual and pocket card to remind them of their task and how to respond to patients during the tool completion, including example response phrases to patients.
	Ensure adherence to treatment protocol	Visits were audio recorded. A research team member sat in each visit and monitored treatment fidelity using the Pain Assessment InfoViz Tool Checklist.
	Minimize contamination between conditions	Use a static comparison study design to reduce contamination of the tool.
Receipt of treatment	Ensure participant comprehension	Post-visit surveys and interviews of the patients were completed to evaluate their understanding of the communication tool.
	Ensure participant ability to use cognitive skills	Patients had to have a pain concern to participate in this study so that they could think about the pain that they have.
	Ensure participant ability to perform behavioral skills	Patients were able to point out to the pain information that reflect their experience on the tool.
Enactment of treatment skills	Ensure participant use of cognitive skills	The interpreter read aloud the pain information to the patient so they could think about their pain using the Hmong terms in the Pain Assessment InfoViz Tool.
	Ensure participant use of behavioral skills	Patient was able to point to the pain information on Pain Assessment InfoViz Tool that aligned with their pain experience.

2.8. Data analysis

Using Microsoft Excel LTSC 2021, descriptive statistics were computed to summarize interpreters' demographic data, the final assessment scores, and the implementation fidelity scores. To analyze the implementation fidelity score, a total percentage score for each visit was calculated by dividing the number of skills performed correctly by the total number of items on the Pain InfoViz Tool Checklist.

The debriefing interviews were transcribed and analyzed using a thematic approach [26]. Specifically, the PI and a research study team member independently read through the transcript to identify initial codes related to interpreters' experiences. Examples of their initial codes were "time constraints," "overall good experience," "technology barrier", "varied use of pocket card", and "unclear purpose of too." After they initially coded the transcripts, they came together to compare their initial codes and generate themes. Example of the themes were "positive experience", "suggestions to improve the training", "logistical challenges," "varying use of training materials," and "benefits of refresher trainings." Any disagreement required reviewing the transcripts together.

3. Results

Four interpreters completed the training and participated in 20 clinical visits during the pilot study using the Pain InfoViz Tool. However, 18 of the visits were specifically related to pain and included in this study.

3.1. Sample

Interpreters' characteristics are presented in Table 2. There were three male interpreters and one female interpreter. All were certified interpreters who have a bachelor's degree. Three of the interpreters were born outside of the U.S. and all have been in the U.S. for at least 20 years. Interpreters ranged in age from 28 to 41 and had between two and 25 years of interpreting experience.

Table 2
Interpreter Demographics.

	n	%
Gender		
Male	3	75
Female	1	25
Born in United States		
Yes	1	25
No	3	75
If not, where were you born		
Thailand	1	25
Laos	2	50
Highest Level of Education		
Bachelor's Degree	4	100
Specific Training on Pain Interpretation		
Yes	3	75
No	1	25
Certification in Interpretation		
Certified Healthcare Interpreter (CHI)	4	100
Types of Interpreting Performed		
In-person	4	100
Telephone	4	100
Position Type [a]		
Staff Interpreter	1	25
Contract Interpreter	3	75
Family Interpreter	0	0

Note. $N = 4$. Interpreters were on average 37 years old ($n = 3$, $SD = 10.8$), had and an average of 9 years of experience ($n = 4$, $SD = 11$), and have been in the U. S. for an average of 33 years ($n = 4$, $SD = 10$).

[a] Interpreter can have more than one position.

3.2. Interpreter communication training results

The interpreters completed, on average, 2.5 practice case studies during the simulation before taking the final assessment. The simulation and the final assessment took, on average, 54 min. While all sessions lasted two hours, one interpreter requested an additional two hours to gain more practice with the case studies in the simulation lab. The mean score of the final assessments was 95%, and none of the interpreters needed to retake the final assessment.

3.3. Interpreters' feedback on training

Initially, a total of 18 items were included on the Pain InfoViz Tool Checklist. However, after the first training session another two items, "Gives a copy of the tool to the patient," and "Gives a copy of the tool to the provider," were added to the tool, making a total of 20 items. This was done as we recognized that these items were an essential component of the communication intervention.

Two common themes were identified during the debriefing interview after the training and before any patient clinic visits. These included: 1) a positive experience with training and 2) suggestions for improving the training.

3.3.1. Positive experience with training

All the interpreters shared that their experience with the training was positive. They agreed that the training was adequate in length, and no one reported any barriers to attending the training. They also appreciated that they had been given the chance to practice using the tool as much as they liked. As stated by an interpreter:

I liked it. I think this is good. I think this takes some time and overtime with use would help.… I think [the length is] acceptable, and you gave me the option to do more if I'd like. (Interpreter 1001).

3.3.2. Suggestions to improve the training

One interpreter could not read in Hmong, thus, to accommodate differences in skills, the PI read aloud in Hmong in the InfoViz Tool to the interpreters and had them repeat the information until they were comfortable.

Although three of the four interpreters were proficient in reading and writing Hmong, all of them felt that the training provided would be sufficient, and that there would be adequate support to train the interpreters who were not fluent in reading and writing Hmong. Most of the interpreters desired to have access to the intervention content, including the tool and pocket card, prior to attending the training session. This is a consistent practice they undertake before any patient assignment to which they are assigned in the clinic setting, as it helps them to become familiarized with the materials. One interpreter stated following:

In real-life situations, we tend to know what we're going to be talking about—if they were there for neuro pain or headaches. We are more prepared to talk about it. You know, to bring all the vocabulary to know what to focus on. (Interpreter 1000).

The interpreters also believed that the training could be improved by making it clear what their role is when using the InfoViz Tool, as some of them had incorrectly assumed that it was their responsibility to evaluate the patient's pain. As one interpreter explicated,

I was looking at this (script). If his foot hurts or arm hurts, is it my role as the interpreter to ask for more specifics? If they just say their hands hurt, should I ask if their fingers hurt too? (Interpreter 1000).

3.4. Pilot study: implementation fidelity during clinic visits

The interpreters had a mean score of 83% (SD =10%) for achieving implementation fidelity during the clinic visits.

3.5. Interpreters' post-study feedback

Overall, the interpreters reported they enjoyed participating in the study and found the Pain InfoViz Tool valuable when interpreting for LEP Hmong patients. Common themes were: 1) positive experience, 2) logistical challenges, 3) varying use of training materials, and 4) benefits of a refresher training.

3.5.1. Positive experience

Interpreters had a positive outlook, reflecting on how beneficial the training had been. They further expressed appreciation for the visuals included in the tool and felt that it was an effective guide for the patient to articulate their pain to the provider. One interpreter expressed it this way:

I would say that my experience was overall good or positive. Having gone through the training, and then also having do the practice training before the actual kind of encounters with the patient and doctor was helpful. So, you have a kind of the mindset to how to use the tool and how to do it beforehand. So that was good. (Interpreter 1004).

3.5.2. Logistical challenges

A few interpreters reported that completing the tool prior to the visit was often challenging due to time constraints, especially when they were running late or if the provider came in early to the clinic room. One interpreter shared:

… I'd say is that maybe sometimes there's not enough time in between to fully complete this form before the provider actually walks in. … Usually, when I was working on this form with, an actual practice, it wasn't out in the in the lobby. It was after the nurse had checked them in in the rooms, so that small window frame was when I'd get to work with the patient on this form. (Interpreter 1000).

Another challenge the interpreters reported was patients reporting different information to providers than what they had previously told to the interpreter while completing the Tool, creating inconsistency in their pain reporting. As one interpreter explained,

I would say one of the challenges was, once you go through and ask the patient, what, you know, pain or what the patient was there to be seen for and you actually fill out the form, sometimes the patient may not always refer to that form when they talk to the doctor, or the doctor

may not ask the patient using the form and so sometimes you have to kind of go back and forth, or kind of remind the patient about some of the things that they had stated before on the form. (Interpreter 1004).

3.5.3. Varying use of training materials

When asked if the interpreters utilized any of the support materials, such as the pocket card or the training materials prior to or during a clinic visit, none of the interpreters reported using the pocket card. However, two interpreters went back to the orientation manual prior to a visit to refresh their memory of the Tool. They shared that they had simply forgotten about the pocket card. One interpreter confirmed, "Yes, when I was informed that they were going to be there I did review the information and from the book that they gave us. … I kind of reviewed the, the PowerPoint." (Interpreter 1000).

3.5.4. Benefits of refresher trainings

There were mixed suggestions about whether a refresher training session would benefit the interpreters. One interpreter believed that a refresher training could be beneficial if the Pain InfoViz Tool changes in any way; otherwise, the interpreters did not feel a scheduled refresher was necessary. One interpreter explained:

If the medical interpreter has been using that form on and off throughout the year, and nothing has changed on the form itself, I think it should be fine if they don't have to go through the refresher training, but if something has changed in the form or if there's a different kind of expectation or a different suggestion then, the interpreter, having a refresher training that would be, good to have. (Interpreter 1004).

However, another interpreter suggested that it would be beneficial to have a more up-to-date training course, which could be conducted either by telephone or virtually. He shared the following:

I think like, a telephone, or just maybe like a quick like maybe Zoom or something like that, so that you can talk about it with the [research team]…because sometimes I feel like during the project it wasn't, uh, it was like, maybe like, 2 to 3 weeks, maybe even sometimes a month before I do it again, you know, so it's not consistent. (Interpreter 1000).

4. Discussion and conclusion

4.1. Discussion

To our knowledge, this is the first communication simulation developed to facilitate pain communication between the LEP Hmong patient, interpreter, and provider triad. Previous studies focused solely on communication tools developed for patient and provider communication. We found that our communication simulation training developed for interpreters to use the Pain InfoViz Tool was feasible, acceptable, and successful in promoting relevant skill acquisition, as evidenced by the high score of the interpreters' final assessment in the training and the implementation fidelity during the clinic visits, mirroring the results seen in studies using similar checklists to evaluate the implementation fidelity of a communication tool [27].

Half of the interpreters experienced varying degrees of apprehension prior to the training. They suggested that we provide them with access to the materials before the training. Future trainings could provide interpreters with background information, an agenda, or copies of the Pain InfoViz Tool beforehand. We also found that, at the start of the training session, asking the interpreter about their comfort level in reading Hmong enabled us to adjust for any concerns. To accommodate for individual differences in skill level, experience, and background, it is important to offer a variety of activities during the training [25].

Additionally, interpreters found practicing in a simulated clinic environment with live performers filling the roles of patient and provider was incredibly beneficial to their training experience. These findings match the receipt fidelity seen in previous studies that involve training providers on the use of a communication tool via simulated experiences and practice [23,27].

Evidence of a small "drift" in interpreters' implementation fidelity occurred mid-way through the pilot study due to a two-month gap of patient recruitment caused by the COVID-19 pandemic. To reduce drift in future studies, refresher trainings, reminders to review training materials and use pocket cards, debriefing check-ins with feedback on graphic aids, and distributing brochures with QR codes linking to demo videos are recommended [24,27].

Some interpreters reported feeling rushed to complete the Pain InfoViz Tool at the clinic due to time constraints, often when running late to the appointment or when the provider comes in early. Time constraints are a common challenge for successful implementation [28]. Future research should investigate methods for enhancing communication and coordination within the care team and interpreters to create a more patient-centered experience. One potential approach is providing interpreters access to the Pain InfoViz tool before appointments, allowing them to review it at their convenience.

Although the pocket card was designed to be a quick reference guide for interpreters, all interpreters reported that they did not use it, mainly because they had forgotten about it. Providing a reminder of the pocket card could promote proper implementation fidelity.

This study, while limited in sample size, is the first to train interpreters on a pain communication tool and develop a robust communication training using simulations. Its strengths include ensuring interpreters understand the tool and reach a competency threshold of 80% before using it in clinical practice. Another limitation of the study was the inability to conduct robust statistical analysis due to the descriptive nature of the collected data. Future research should expand this work to multiple organizations, increasing the sample size of Hmong interpreters and collecting more quantitative data for more robust analysis.

4.2. Innovation

There are several innovative elements of this study. First, this study developed and used a novel communication intervention to enhance pain communication among LEP patient, interpreters, and providers by bridging the communication gap between LEP Hmong patients, interpreters, and providers. Second, the innovative application of this Pain InfoViz Tool in practice simulations for pain assessment opens up possibilities for its adaptation to other screenings such as the Patient Health Questionnaire-9 (PHQ-9) depression screening or the Generalized Anxiety Disorder-7 (GAD-7). Thirdly, we extended the application of the high-fidelity simulation trainings, a well-established practice in nursing and medicine education, into the field of medical interpreting. This new adaptation demonstrated effectiveness of the training as evidenced by high implementation fidelity scores obtained during the pilot study. Finally, our high-fidelity simulations for medical interpreting provide a pioneering approach by offering varied levels of difficulty in case studies involving real individuals, enhancing the training experience.

4.3. Conclusion

This study provides evidence that the training is feasible, acceptable, and effective in ensuring fidelity of the medical interpreters' implementation of the Pain InfoViz tool during provider-patient communication. The Pain InfoViz Tool training for interpreters and implementation fidelity evaluation strategies outlined in this study can be an important step towards bridging the gap in provider-patient communication and with potential applications in other screenings like depression and anxiety assessments. Further research is warranted to assess its effectiveness in different contexts, including different languages.

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Declaration of Competing Interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests:

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.pecinn.2023.100217.

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