

What Does Pain Look Like?

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Chronic pain is a complex experience that pain scores and questionnaires fail to capture in its entirety. Perhaps even language itself may be short of descriptors to fully encapsulate the experience of living with chronic pain.

Visual art provides a descriptive outlet for patient empowerment, which we aimed to harness in our project. In this project we aim to bridge art and science to answer one of the fundamental questions of the human experience, which is “what does chronic pain look like?”.

Using artificial intelligence and virtual reality, we produced artwork derived from open-ended prompts from testimonies of individuals living with chronic pain conditions.



Project Walk-Through

Recruitment

Individuals living with chronic pain were recruited via various communication channels at McGill University and McGill University-associated hospitals. Participant testimony were collected through a semi-structured interview. Key terms from participant interview responses were transcribed and extracted as part of a prompt sequence which was entered into an open-source AI platform called StabilityAI. The images generated by the AI platform were modified through post-processing using Adobe Photoshop and other similar digital visual art tools. Participants were also given the opportunity to use the virtual reality tool Tilt Brush on the Oculus VR system to visually describe their pain experience.

Participants

The majority of participants in this project were women. The interview revealed a great appreciation for initiatives that promote visibility to chronic pain, but also a desperate need to unify the understanding of chronic pain across health care professionals. Of note, patients with endometriosis and fibromyalgia described feeling that their condition was a “basket diagnosis”, meaning that if all other conditions were ruled out, they were diagnosed with a condition without many therapeutic options. These participants shared that they felt their symptoms were minimized or ignored due to large-encompassing diagnosis with mechanisms that remain poorly understood and therefore, poorly managed. Participants reported that the interview and art generation process was therapeutic.

Aims

We hope that by sharing this art with our community, we contribute to the effort of bridging the gap between the different perspectives on the experience of pain that may exist between basic science researchers, clinical practitioners, clinical researchers, chronic pain patients, and their families.

Currently, our two areas of focus are:

- 1) The development of an AI-supported Augmented Reality (AR) tool that will provide a novel diagnostic tool for clinicians that allows patients to lead the diagnostic process.
- 2) The continuation of our work to hone the AI-based generation of two-dimensional visual representations of the chronic pain experience based on our novel semi-structured questionnaire.

We hope that this work will give back to the community of those living with chronic pain conditions and allow for patient self-empowerment.

Our Story

Our investigation started as an academic inquiry about the subjectivity of the chronic pain experience and quickly moved into a new direction. What if this opportunity to explore a research question could turn into the practical application of a new intervention for people living with chronic pain?

Initial Question:

Can AI be adapted for use to better understand and promote awareness of chronic pain conditions?

Questions from B21:

Can other virtual technologies like VR be used to elevate the voices of those living with chronic pain?

Can the use of AI platforms be ethical? Is the decision to not use it for this application despite the potential benefit to the target demographic unethical?

Is there the potential for the use of a novel method to facilitate art therapy for patients living with chronic pain?

Does AI have the potential for use as a diagnostic tool for this population in clinical environments?

How do we best support the empowerment of patients with lived experience with chronic pain?

Could components of this project be developed into a novel tool for use in healthcare?

What are the core values of this project that will guide the future of this project beyond B21?

Takeaways From the Project:

Our belief in the democratization and accessibility of the use of virtual technologies for healthcare applications will guide our future work. We are continuing this line of research with the aim of developing a novel AI algorithm to address the needs of patient and clinician stakeholders in combination with the semi-structured interview to produce visual representations of the chronic pain experience for therapeutic purposes.

We will continue to ground our work with patient needs at the forefront of our designs with the goal of revolutionizing how we diagnose and treat chronic pain conditions.

