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# On The Other Side: An Interactive Narrative to Incite Awareness and Empathy Towards Social Effects of Chronic Pain

## **Ajmal Shah**

National Institute of Design  
Gandhinagar, Gujarat,  
382007, India  
ajmal\_s@nid.edu

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## **Abstract**

Chronic pain is an ailment that affects over 60 million [1] people all over the world. It is a poorly understood condition by both clinicians and the society at large. Chronic pain manifests in many different forms and imposes immense physical limitations on the sufferer's body. However, the social and mental issues associated with chronic pain are often overlooked. Although modern medicine alleviates the physical symptoms of chronic pain, it fails to address issues that feast on the sufferer's mental health. Moreover, awareness, acceptance and empathy towards the sufferers are lacking in the society. On the other side is an interactive narrative that employs gameplay as a medium to induce empathy and awareness about social stigmatization and isolation that patients with chronic pain conditions face. The narrative transports the player into the troubled life of a chronic pain patient and their altered relationship with their own body.

## **Author Keywords**

Conceptualization; Storyboarding; Mobile Experience; Gameplay; Empathy; Chronic Pain

## CSS Concepts

• **Human-centered computing** → **Interaction design**; • **Social and professional topics** → **User characteristics**

### Introduction

Chronic pain is one of the most common reasons that force patients to solicit medical assistance. Nevertheless, it is often untraceable and incurable, leaving the patients all the more frustrated and demoralized. In addition to the physical struggle the sufferers have to endure, they are often faced with extreme social and mental struggles as well. The lack of awareness of the effects of chronic pain in society ultimately leads to social stigmatization and thereby self-induced social isolation is a painful byproduct of this ailment. Medical systems focus on the physical aspect of the patient and prescribes treatments for the physical symptoms. However, social and mental aspects are largely unaddressed by a physician. Although the medication might alleviate the physical pain, due to the restrictions that are applied to their lifestyle, the social effects on the individual continue to grow. On the other side is an immersive narrative that explores this aspect of chronic pain.

### Design research

Extensive research was conducted prior to determining an appropriate and conclusive design approach for this project. The various forms of research undertaken are as follows.

- i. *Literature Review*  
Comprehensive studies about chronic pain have been thoroughly investigated to gather information about the symptoms and

accompanying effects of this condition. The authors of [2] have conducted extensive research on the history of chronic pain management in the United States of America. In this manuscript, the basic mechanisms of chronic pain are investigated, and pain treatment is explored. In [3], the authors have conducted a highly comprehensive study of chronic pain that is specifically no malignant thereby giving a deep insight into patient experiences. This study has been vital in this project. The authors of [4] have explored the main management experiences of primary care patients through photographs. This study has also been helpful in deriving insights for *On The Other Side*.

- ii. *Personal Interview*

An online survey was conducted within the campus with a sample size of 200. The participants of the survey included men and women between the ages of 20 and 30 to identify chronic pain sufferers in this demographic. The participants were interviewed with an emphasis on disclosing information about the onset of their pain and major lifestyle changes caused by it. They were asked about the contrast between their lives before and after the chronic pain and how it made them feel about themselves.

- iii. *Expert interview*

An expert interview was conducted with the in-house psychologist who talked about mental mechanics and defense systems. An insight into the psychological effects of pain and how people cope with it in terms of

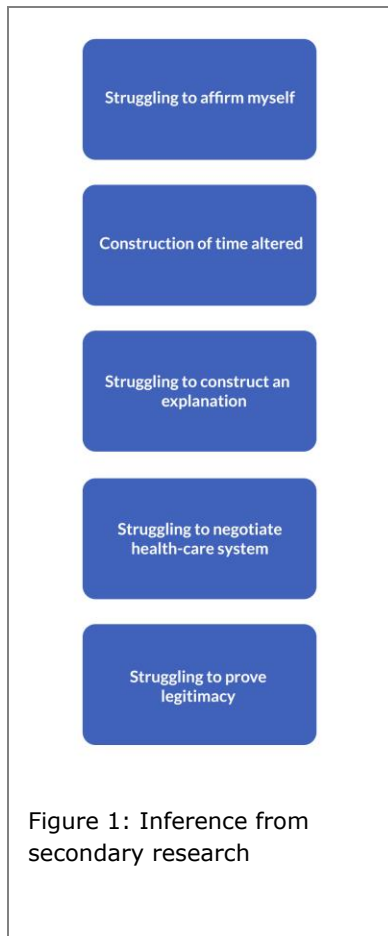


Figure 1: Inference from secondary research

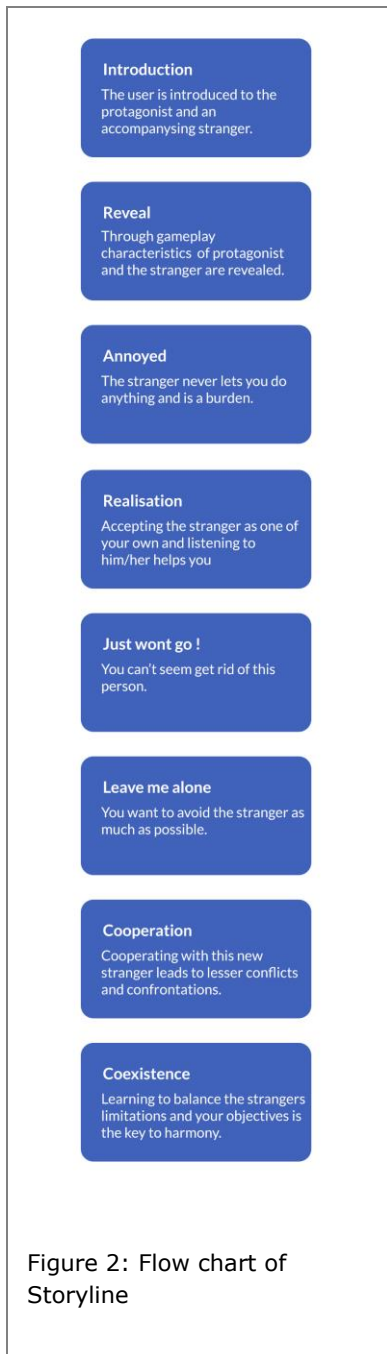


Figure 2: Flow chart of Storyline

defense mechanisms was gained. The influence of an uncontrollable agent like pain often transforms outward outbursts to inward conflicts in these individuals.

- iv. *Retrospective diary entry*  
5 participants were requested to record their past experiences with chronic pain and instances that have caused them discomfort in the social space due to this. This gave an insight into the day to day struggles that these individuals undergo including simple life decisions that would be considered trivial for a normal person.

### Design process

- i. *Design specifications*  
The major specifications that were set for this project were in terms of simplicity, scalability and adaptability. The medium, modality, mechanics and the narrative were the key factors in the design. To stage this experience multiple modalities ranging from interactive installations, board games and role-playing games were explored. Gameplay was chosen as the medium as it has an innate ability to induce empathy for the characters [7]. In order to facilitate scalability and adaptability for a larger target audience, the mechanics was simplified, and an interactive narrative was adopted as it improved player engagement.
- ii. *Design plan*  
In order to formulate the narrative, the 3-act structure [6] was adopted. In this model of storytelling, the story is divided

into 3 parts namely, setup, confrontation and resolution. In the first act, the characters and their personalities are introduced. Since the main consequence of living with chronic pain is difficulty in making choices in everyday life, the narrative was designed to have multiple storylines that progress differently based on the player's choice. This constitutes the second act and the final act is the reveal and resolution of the protagonist's problem.

- iii. *Implementation*  
The narrative is implemented as a Progressive Web application which can be played in a mobile device across all platforms through a web browser for maximum adaptability. The content and mechanics were programmed using ReactJs, html and css. Sensor based interactions were employed to achieve maximum user engagement. Gyroscope, accelerometer and orientation sensors in the mobile device are leveraged to create active engaging mechanics and interactions. Moreover, instances from day to day life were materialized as visuals to set a context to the narrative. The background images were envisioned on paper and later materialized using photoshop (Figure 3). To induce a sense of conversation, the narrative assumed the modality of a chat interface.



Figure 3: A picture of the images used in the game

### Final design solution

The final design solution is presented as an immersive and interactive mobile experience that takes the player through the life of a chronic pain sufferer. The features of this application are as follows:

- *Personification of pain*  
In this experience, the pain is isolated and personified as an external entity as most chronic pain patients perceive their pain as an external self and do not associate their impaired body as their own. The pain character is personified as a partner, enabling the player to view the narrative as a relationship issue as it is easier to be empathized with. In the third act of the game, it is revealed that the partner is the pain within the player itself thereby giving some perspective to the player in retrospect.
- *Context driven narrative*  
Layered meanings in the narrative that are deeply rooted in the context act as Easter eggs for the user to discover. For instance, the pain character makes an appearance only when the protagonist works relentlessly for long periods causing discomfort to the body. This is depicted in the narrative as tapping the screen to work, in two different scenarios. The longer the player is asked to tap the screen, the longer the character works in the story and thereafter the pain character makes an appearance.
- *Active interactions*  
Sensor based interactions are designed to emulate the direct effects of chronic pain. These interactions require the user to actively

perform physical actions such as shaking, walking, etc to further enhance engagement and help the player understand the story through actions.

- *Multiple storylines for varied personal experiences*  
The player is given multiple choices at critical moments in the narrative. Based on the player's choice, different conflicts unfold. This feature enables the player to understand how a simple choice can have large social or personal impact on a person living with chronic pain. Additionally, this feature makes the game more personal as it forces the player to think from the character's point of view before making a choice.
- *Scorecard with explanations*  
Intermediate scorecards that define the effects of the player's choices on the character and the social conflicts faced are presented throughout the narrative. These cards provide an explanation about each action or penalty. The scorecard health bar encourages the player to make thoughtful choices to avoid losing the game. They make the player aware of repercussions of each choice accompanied with apt feedback.
- *Resolution as a message for patients*  
The resolution section of the narrative promotes the idea of coexistence with the pain as a healthy way of tackling its effects rather than intense resentment towards it. The game leaves the player with the message that understanding the pain and making an effort to act accordingly can make the life of the sufferer easier. Slight adjustments in the

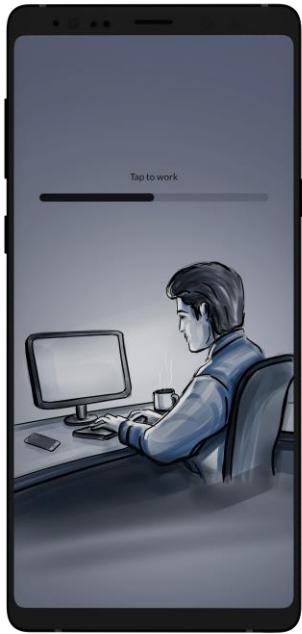
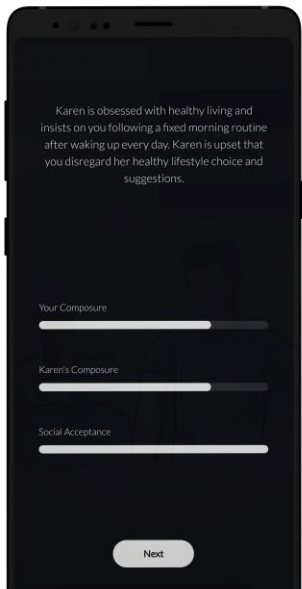


Figure 4: Tap to work and scorecard



lifestyle or routine leads to noticeable changes in both the physical and mental state of the individual. This instills more confidence in them to face social situations and lead a more harmonious life.

### Testing and Evaluation

User testing was conducted with 12 participants between the ages of 22 and 45. This included people with and without chronic pain and the feedback received was analyzed carefully. Majority of the players reported that the pain character came across as frustrating and tiresome in the beginning of the game. However, there was a visible reaction of surprise when the character who seemed to be a controlling and emotionally dependent partner in the initial stages, turned out to be the protagonist's chronic pain. All the players reported that the game forced them to contemplate and rethink their opinions on pain.

A focus group discussion was also conducted with peers to evaluate and improve the game. The feedback suggested that increased specificity and action-based interactions in the game would emphasize the turmoil of the character better.

### Conclusion and Future Work

In conclusion, *On The Other Side* strives to inculcate a deeper understanding of the struggles of a person living with chronic pain. The game enables the players to have a firsthand experience of the limitations and lack of flexibility in a sufferer's daily life. By adopting an immersive narrative with multiple storylines, this application makes the player aware of the

consequences of the choices that the sufferer makes and highlights its impact on their personal lives. It also shows how the condition curtails their spontaneity and imposes restrictions on them in the social space.

One of the limitations in this application is that it is dependent on text and needs more engaging interactions in order to maintain the attention of the player. This is one aspect that will be changed in the specific kind of pain. Each of the modes will have a different narrative catering to different chronic pain conditions thereby adding specificity. Exploring more active interactions for curating a more engaging experience as well as creating a background score to set the mood of the game are other possibilities for future work. In future work, the application will be updated with additional features and complexity. The game can be portrayed in an episode format with modes to select specific kind of pain. Each of the modes will have a different narrative catering to different chronic pain conditions thereby adding specificity. Exploring more active interactions for curating a more engaging experience as well as creating a background score to set the mood of the game are other possibilities for future work.

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