

# Self-Healing of Anxiety through an Intelligent System

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A Dissertation Submitted to  
Indian Institute of Technology Hyderabad  
In Partial Fulfillment of the Requirements for  
The Degree of Master of Technology/ Doctor of Philosophy



భారతీయ సాంకేతిక విజ్ఞాన సంస్థ హైదరాబాద్  
भारतीय प्रौद्योगिकी संस्थान हैदराबाद  
Indian Institute of Technology Hyderabad

Department of Design

June, 2022

## Declaration

I declare that this written submission represents my ideas in my own words, and where others' ideas or words have been included, I have adequately cited and referenced the original sources. I also declare that I have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in my submission. I understand that any violation of the above will be a cause for disciplinary action by the Institute and can also evoke penal action from the sources that have thus not been properly cited, or from whom proper permission has not been taken when needed.



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# Approval Sheet

This thesis entitled “Self-Healing of Anxiety through an Intelligent System” by Apurva Ganesh Kalhe is approved for the degree of Master of Technology from IIT Hyderabad.



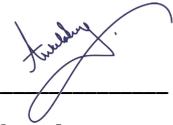
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Dedicated to

All the anxious minds

## **Abstract**

Mental health is an important aspect of overall wellness. It influences how we think, feel, and act. The pandemic may have had a variety of effects on our lives, including uncertainty, disruption of daily routines, financial stress, and social isolation. Anxiety and depression, have been shown to worsen in the aftermath of a pandemic. Anxiety is taken forward within thesis for research and design. This is an industry project for which I am collaborating with I'm Beside You, a Japanese start-up. They specialize in analyzing emotions using artificial intelligence. The solution's central idea is to use this intelligent technology to analyze anxiety and then provide users with a personalized healing experience that acts as a friendly introduction to caring for one's mental health. Before going to a therapist, the users will get an idea of the kind of therapies and activities that usually are suggested by therapists. It further expands to connecting with professionals as well in the case of extreme anxiety.

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# 1. Introduction

## 1.1 Mental Health

Mental health is a significant component of our complete health. The World Health Organization (WHO) defines mental health as “a state of well-being where one is aware of one's abilities, is able to cope with the normal stresses of life, can function effectively and productively, and is able to contribute to one's community” (WHO, 2018). Our mental health is influenced by our emotions, psyche, and behavior in the society. It also shows out how we handle stress, connect with people, and take decisions. Mental health is important throughout one's life, from childhood to adulthood. The COVID-19 pandemic may have had a range of effects on our life, such as uncertainty, disturbance of daily routines, financial stress, and social isolation. People have experienced stress, anxiety, fear, grief, and loneliness as a result of the COVID-19 epidemic. Anxiety and despair have been observed to worsen as a result of the pandemic. Anxiety is defined by the American Psychological Association (APA) as a feeling of tension, anxious thoughts, and physical changes like high blood pressure. Anxiety disorders are categorized by persistent disturbing thoughts. Other symptoms like sweating, shivering, disorientation, or a rapid heartbeat may also be present. (Association, n.d.) Anxiety is researched and a solution for the same has been attempted to be designed in this thesis.

## 1.2 Inspiration

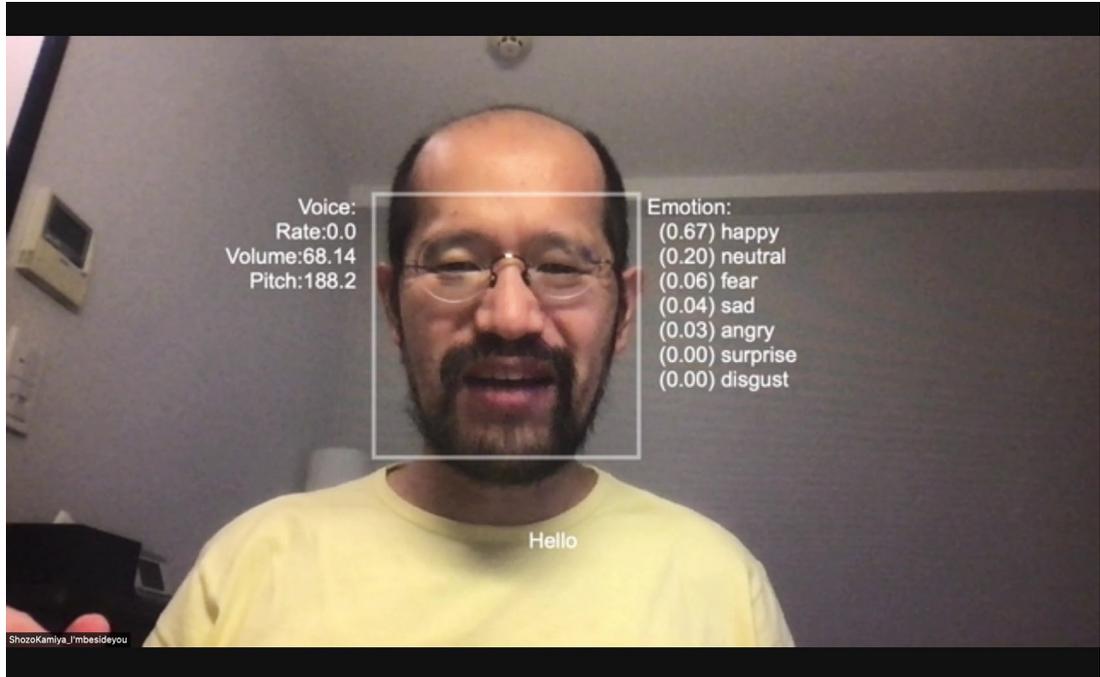
The inspiration or motivation to take up this topic comes from a personal experience of suffering from mental health issues during pandemic while suffering from Covid-19. The phase inspired me to study and put efforts into designing a solution that would be helpful.

## 1.3 Industry Based Project

For my thesis project I collaborated and interned with I'm beside you, a Japan based tech startup(<https://www.imbesideyou.com/english>) as a UI/UX designer. The company creates AI-powered products that recognize emotions and assist people in coping up with them. The company's values are to create a society where all people respect each other and where every encounter is a learning experience.



Below is a screen capture of the Emotional Analysis done by the company using their desktop app.



**Figure 1: IBY Emotion Analysis**

## 2. Design Process Overview

### 2.1 Design Methodology

The double diamond methodology was used in the process of design for the thesis. This methodology was chosen as mental health is a sensitive and a vast topic. Exploring a mental health and then deep diving into it to work on a focused solution was needed. Here is a diagram depicting the stages in the process.

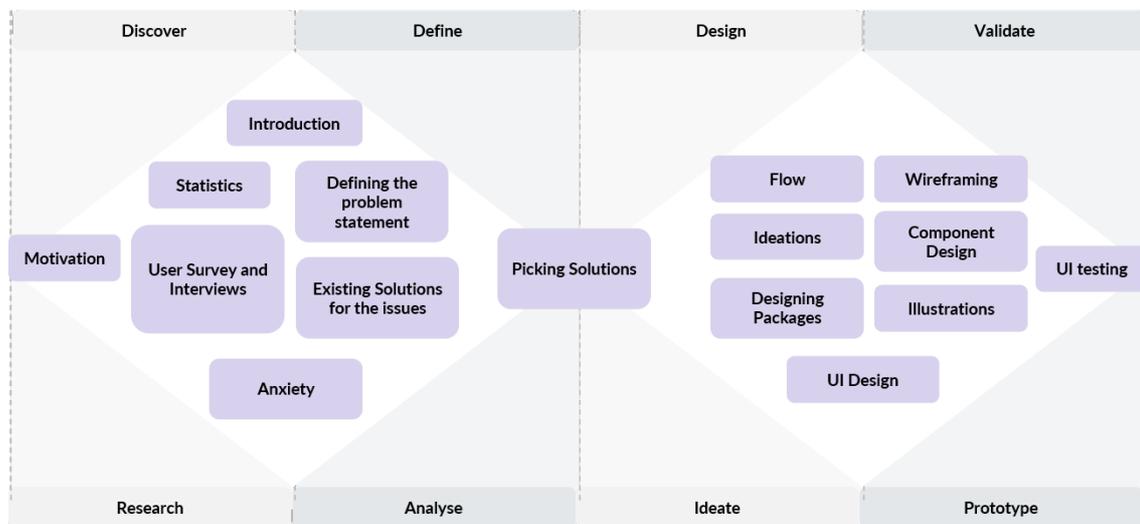


Figure 2: Double Diamond Design Method

# 3. Primary Research

## 3.1 Research - 1

Mental health is a broad word that encompasses a wide range of difficulties that must be addressed. The target age group for this study is 18 to 24 years old. There are several reasons for this, including the fact that 14% of the Indian population is between the ages of 15 and 24. (Sports) In addition, UNICEF estimated in 2021 that one out of every seven Indians aged 15 to 24 is depressed or has little enthusiasm in doing activities. According to a few other study studies, this age group is experiencing an increase in mental health concerns. As a result, this drives me to learn more about this age group's issues. A survey was conducted with 287 participants. This survey indicated that anxiety and depression are the main things that these participants were going through.

Overall how would you rate your mental wellbeing?  
287 responses

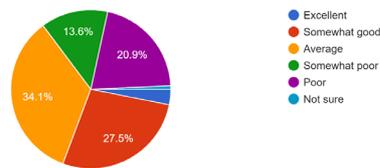


Figure3.1

During the past year, have you had any problems with your work or daily life due to any emotional problems, such as feeling depressed, sad or anxious?  
286 responses

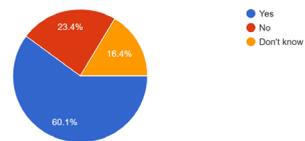


Figure3.2

During the past year, how often has your mental health affected your relationships?  
287 responses

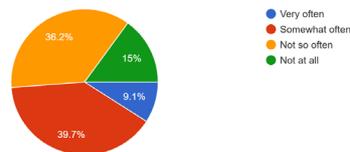


Figure3.4

Since the pandemic hit what have you felt the most?  
282 responses

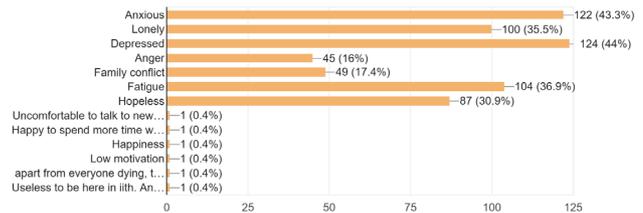


Figure3.4

When did you last get your mental health examination done?  
286 responses

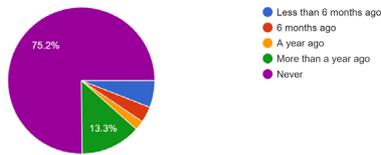


Figure3.5

Have you seen a therapist in the recent past?  
287 responses

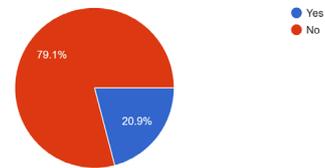


Figure3.6

Figure 3: Survey 1 Outcome

### Summary of Survey Findings:

- The above research shows that around 60% of the respondents are facing one or the other mental health issue and they are completely aware of it.
- Relationships, health and work have been affected the most due to mental health decline in the pandemic.
- Anxiety and depression were found to be the most pressing issues in this age group. Hence, I took up anxiety to focus on.
- 82% of them have said that they have had some or the other issues during the past 1 year. This shows that a great number of users are dealing with mental health issues out of which only 20% choose to go for therapy. Users are very hesitant about going to a therapist or even taking a mental health examination. This is an alarming situation that needs interception.

## 3.2 Research - 2

After understanding from the first survey that anxiousness is one of the biggest mental health issues faced by the age group targeted another survey was shared to understand more about anxiety and the problems faced by users. This survey was conducted in cities of Hyderabad and Pune between age groups 16 to 26. Below 18 years of age are considered as children and have different parameters of mental health diagnosis and cure. Hence the age group decided was 18 to 24 years of age. Find below the statistics of the survey.

## GAD-7 Test

Spitzer and colleagues created the Generalized Anxiety Disorder Measure-7 (GAD-7) It has 7 questions and is a tool to recognize the level of GAD (Spitzer RL, 2006) The GAD-7 was first validated in a large primary care sample and found to have strong reliability, as well as measures, factorial, and procedural validity (Spitzer RL, 2006) For sensitivity (89 percent) and specificity (89 percent), a cutoff score of 10 was found to be the best (82 percent ) (Lauren A. Rutter, 2018)

This test was used to evaluate further questions and the results are as shown below.

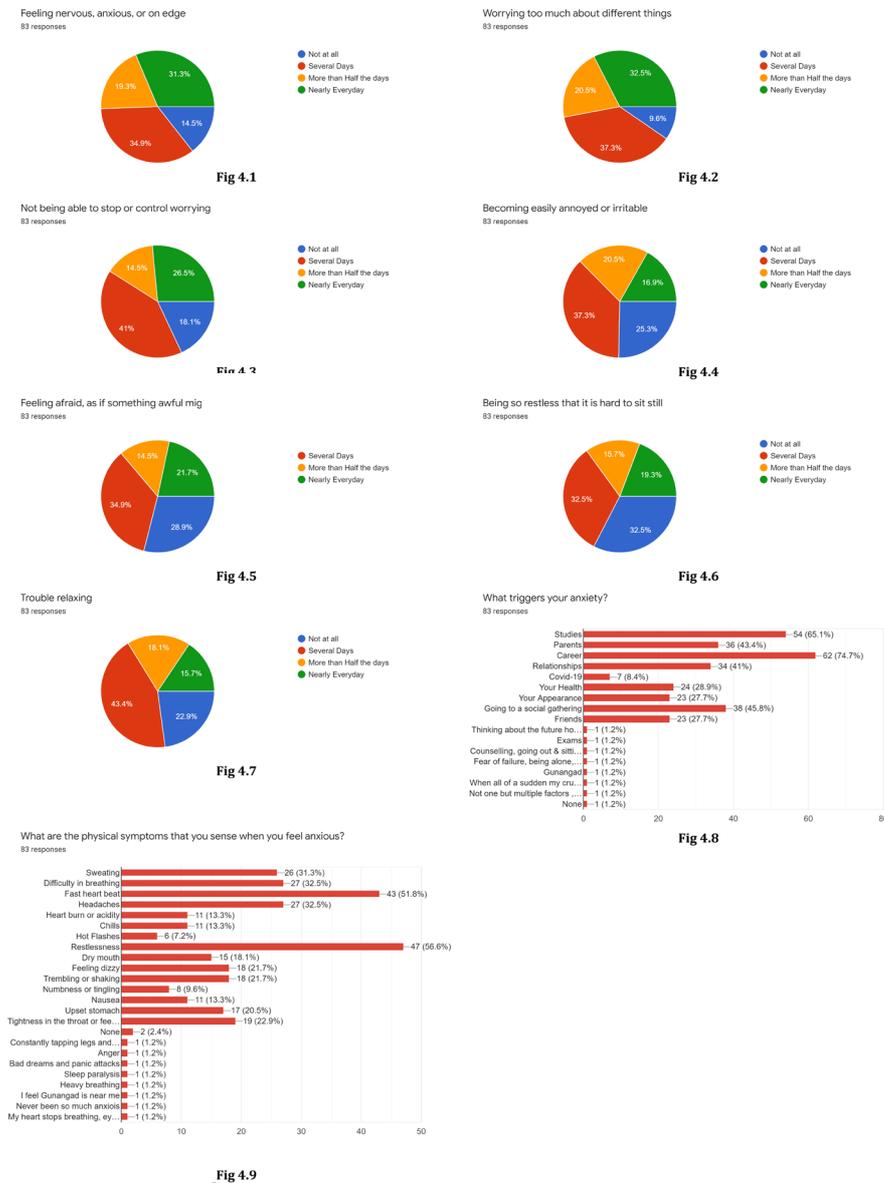


Figure 4: Survey 2 Outcomes

- In all the seven questions the highest percentage of answer were several days, i.e. 37.9%. This shows that several days users suffer with anxiety
- The main triggers found were studies, career, relationships, parents, covid-19, friends etc.
- Symptoms commonly found were restlessness, fast heartbeat, difficulty in breathing, headaches, sweating, tightness in the throat etc.

### 3.3 User Interviews

To understand the users in further depth 10 interviews were conducted. Below are a few comments given by the users.

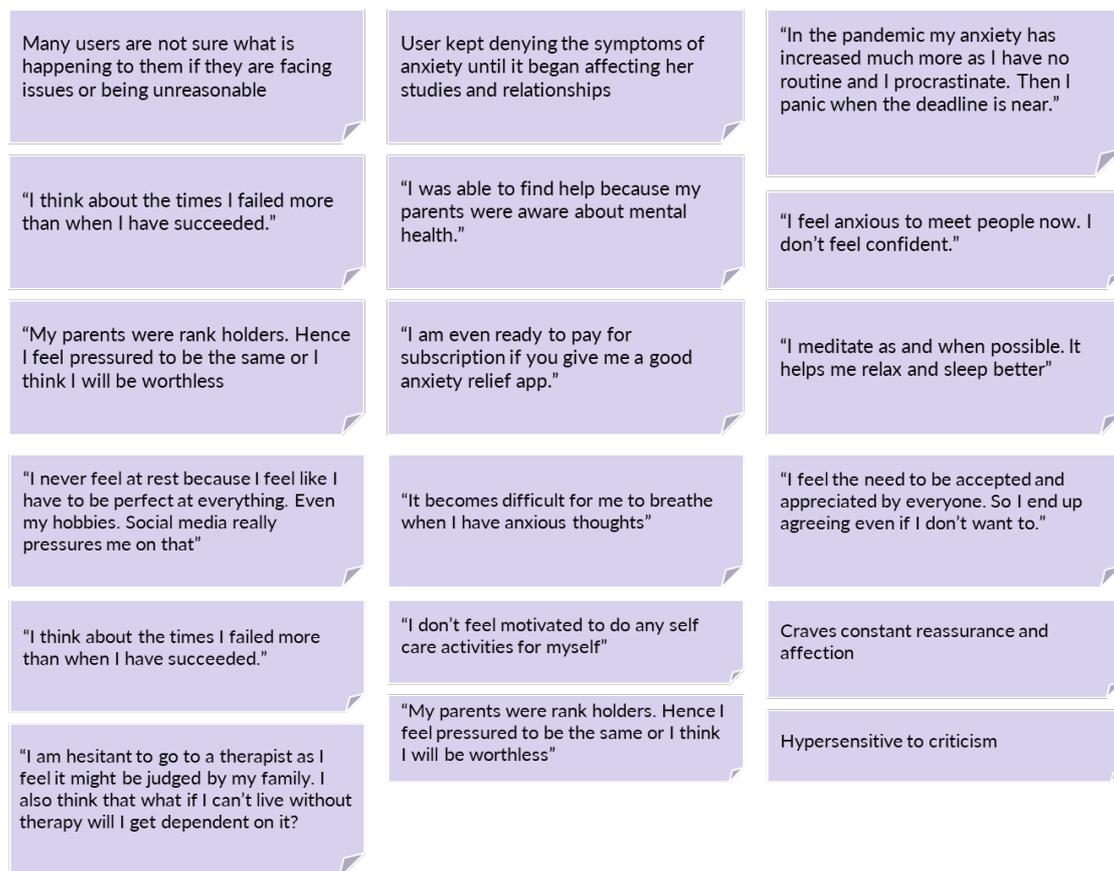
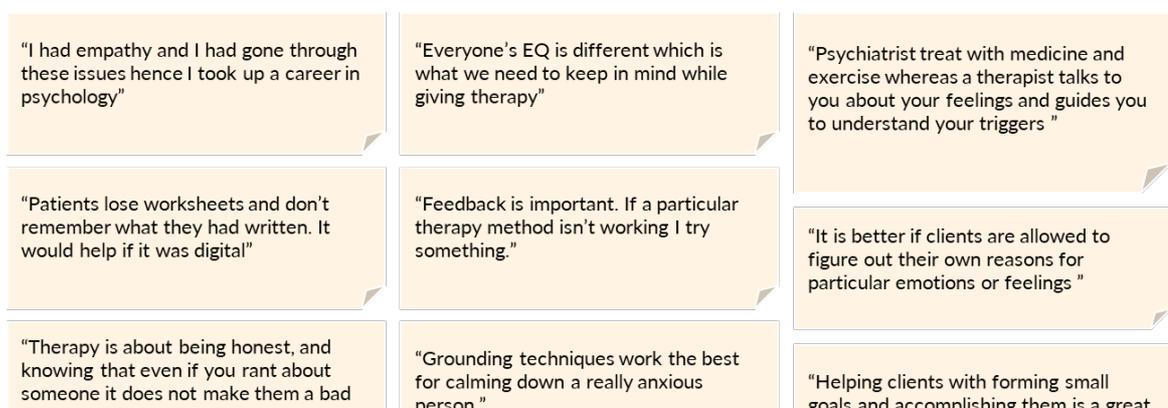


Figure 5:User Interview Quotes

### Interviews with Therapists



### 3.4 Personas and Empathy Maps

Based on the above interviews two personas were created as given below



**Pooja**  
Student  
Age – 19 years  
Education – Engineering  
Place Hyderabad

<b>Bio</b>	Pooja is an engineering student who is studying in Hyderabad. She was one of the top rankers in her city for entrance exam. She lives in the college hostel. She is an introvert. She has very few friends and is closest to her family. From the past few years, she has begun to feel anxious most of the time. She feels apprehensive to go to a therapist as her parents never approved of it.
<b>Frustration</b>	Perfectionist attitude towards everything. Self-critical and remembers shortcomings more. Uncomfortable in a social circle. Avoids making new friends.
<b>Goals</b>	Have a healthy mind and body. Enjoy hobbies and want to feel like I deserve free time. Not feel anxious about little things always. A solution that is always handy during an anxious moment.
<b>Triggers</b>	Studies, Exams, Career Friends, Appearance, Social Gathering, Relationships
<b>Physical Symptoms</b>	Sweating, Headaches, Extreme restlessness, difficulty in breathing

Figure 7: Persona 1

Empathy Map

**Thinks**

1. Pooja thinks more about the times when she has not done well than her success
2. She thinks she has to be the best even at her hobbies
3. She thinks she can't be socially cool or accepted always.

**Feel**

1. Pooja feels that it is better to be stressed as she will finish on time
2. She feels that smoking and alcohol reduces stress and makes you feel easy
3. She feels that she sweats too much during social interactions and examinations.

**Pain**

1. Fear of failure in exams
2. Waking up daily with anxiousness and finding reasons to feel restless about
3. Difficulty in breathing and high heart rate while having anxious thoughts
4. Worrying about the results
5. Perfectionist even in hobbies
6. Health issues like heart burn, headaches and upset stomach
7. Nervous to go to social gatherings

**Persona 1 - Pooja****Do**

1. She sees herself panicking before exams and submissions
2. She sees only the ideal people perfectly on time with everything
3. She sees her friends also anxious many times

**Say**

1. She says that her restlessness has increased since she got into college
2. She says that her heart races, she gets chills, she has acidity, headaches and insomnia

**Gain**

1. Usually manages to over work which may benefit in some assignments
2. Gets more work done in less time
3. Clean freak so has a tidy space
4. Always assess risk in every plan

**Figure 8: Empathy Map 1****User Persona 2****Aakash**

Student  
Age - 21 years  
Education - Engineering  
Place Hyderabad

<b>Bio</b>	Raj is an engineering student at IIT. He studies usually at the last moment. Likes to watch football and play cricket. Has few friends. He can't complete his tasks on time. It is the time for placements and he is unable to concentrate both on studies and placements. He leaves everything to the last min and feels very anxious and pressurized at the end.
<b>Frustration</b>	Restlessness has become common. Unrealistic deadlines cause panic and frustration. Difficult to share experiences of anxiousness with others.
<b>Goals</b>	Need to understand how to manage anxiousness and find its root cause to treat it permanently. Unsure about a therapist and wants an easier way to treat anxiety. Need daily reminders to work on himself in terms of anxiety.
<b>Triggers</b>	Studies, career, friends, parents, Appearance, Covid 19, Social gathering, Parents
<b>Physical Symptoms</b>	Difficulty in breathing, Fast hear beat, Chills, Dizzy, Numbness

**Figure 9: Persona 2**

## Empathy Map

### Thinks

1. Aakash thinks that he cannot function without anxiety. He needs to feel the last min panic to begin studying
2. He thinks that being calm makes him lazy.
3. He thinks that people will judge him for going to a therapist
4. He thinks that his course is too hectic that causes all these feelings

### Feel

1. Overwhelmed during exams and submissions
2. Sad when pressured due by parents
3. Feeling isolated in social gatherings

### Pain

1. Always anxious for any academic work
2. Difficulty in breathing often
3. Feeling stuck in a loop of anxious thoughts
4. Involving in activities that waste more time and lead to more restlessness
5. Afraid to go to a therapist as unsure and judgemental about it.



Persona 2 - Aakash

### Do

1. He looks for options online to help him with anxiety but does not know what will help.
2. Eats a lot due to stress
3. Overthinking and unable to sleep
4. Watches Netflix or distracts with social media to cope with anxiety
5. Resorts to unhealthy eating habits and drinking to feel calm

### Say

1. He blames himself for overthinking and anxiousness
2. He says he is so weak willed that everything affects him
3. He says that people make him anxious so he isolates himself

### Gain

1. Anxiousness at the end makes him speed up his work
2. He is aware about his anxiety and is actively looking for options that would help him

Figure 10: Empathy Map 2

## 4. Literature Survey

### 4.1 Managing a Mental Health Disorder

Any mild mental health disorder needs to be managed by balancing between self-care and monitoring and assistance from family, friends and experts.

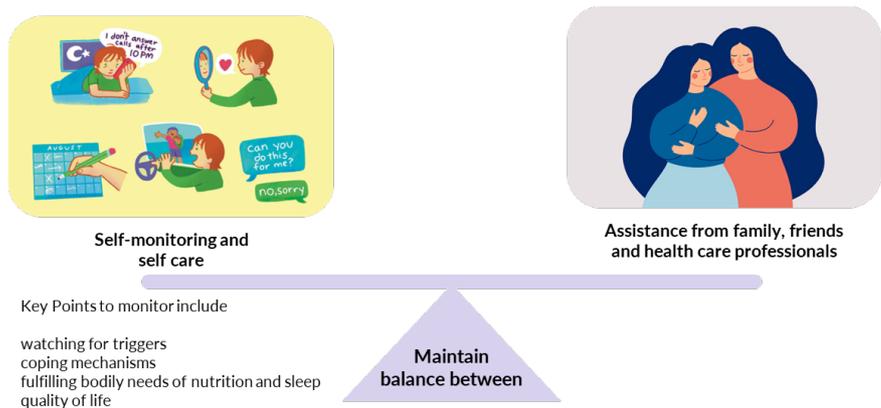


Figure 11: Balancing Mental Health

### 4.2 Experts in Mental Health

Therapists, counsellors, psychologists, and psychiatrists are among the mental health specialists. When will we be able to see a professional?

The following are some of the reasons why we should consult an expert.

1. They simply need to achieve personal goals, modify behaviours, or find a trusted stranger with whom to share their lives.
2. They have depression, anxiety, trauma, or compulsive habits as symptoms.
3. They have suicidal or self-harming thoughts.
4. A person is subjected to a horrific occurrence.
5. Medications for mental illness have severe side effects or do not provide relief.

This demonstrates that seeing a professional does not require a specific diagnosis. According to an article regarding the number of psychiatrists in India, the country now has around 9000 psychiatrists. Over 700 psychiatrists graduate yearly. So, India has 0.75 psychiatrists per 100,000 population.(Kabir Garg, 2019) This shows that there is a scarcity of experts required to help people in mental health.

### 4.3 Anxiety

Anxiety is defined by the American Psychological Association (APA) as “a sensation of tension, anxious thoughts, and bodily changes such as elevated blood pressure.” (Association, n.d.) Anxiety Disorder (AD) according to American Psychiatric Association (APA) is the most common form of mental disorder affecting 30 percent of the adult population at some point in their lives. (Association, n.d.)

Anxiety disorders is related to avoidance many times. Work, school, and relationships may all suffer. To diagnose with anxiety disorder, the fear or anxiety must:

- Be out of amount in the situation or not right for the age group
- Hinder the capability to do the normal tasks.

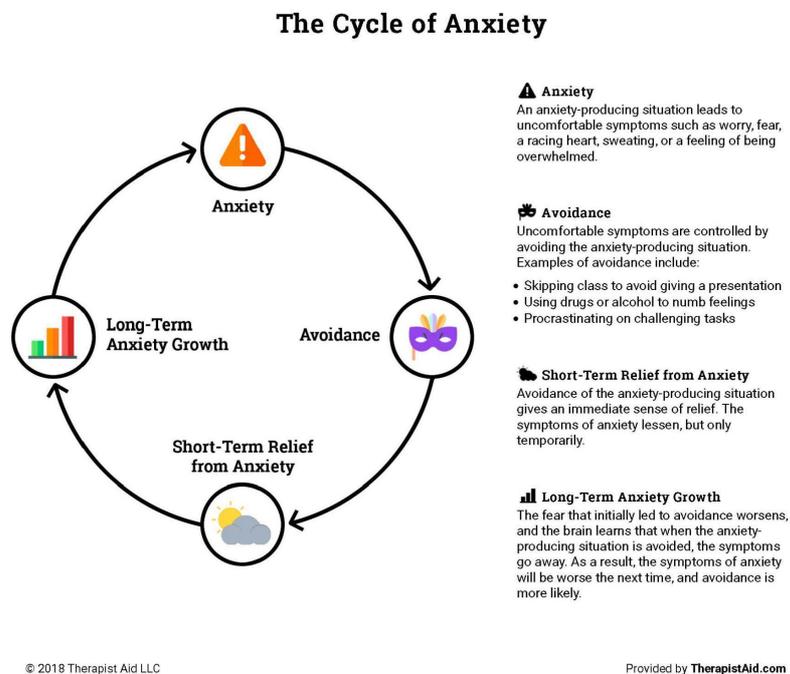


Figure 12: Cycle of Anxiety (Therapist Aid, 2018)

### How anxiety affects our brain?

Amygdala

(Almond-shaped structure in the brain that acts as a "alarm system"). Anxiety and terror reactions are created, maintained, or modified by the region of the brain that creates, maintains, or modifies them. - Compare and contrast with The Cortex is the brain's main processing unit.

The Brain's Cortex: The Reasoning and Logic Brain –Conscious Memories – Awareness –Detailed Information (Catherine M. Pittman, n.d.)

## **4.4 Anxiety Symptoms, Treatment Options and Self Treatment**

Symptoms:

- restlessness
- overpowering worry
- amplified irritability
- difficult to concentrate
- difficulty in breathing
- insomnia
- Ear rubbing or scratching
- Forehead rubbing or scratching
- Hair pulling
- Hands rubbing or scratching
- Hands tapping
- Knuckle cracking
- Nail biting
- Nape rubbing or scratching
- Smoking
- Sweating
- Fast heartbeat
- Acidity or heartburn
- Chills
- Hot flashes
- Dry Mouth
- Feeling dizzy
- Trembling or shaking
- Numbness
- Nausea
- Upset Stomach
- Feeling of choking

Treatment Options

- Psychotherapy
- Cognitive Behavioral therapy
- Medication

Self-Treatment

- Stress management
- Grounding techniques
- Meditation
- Mindfulness
- Support Groups

The above data was found through various sources but most importantly in the article “Anxiety Disorders” by NIMH (Health, n.d.)

#### 4.4 Anxiety due to COVID-19

Anxiety and depression symptoms were far more common during the pandemic than before (anxiety: 8.1 percent and depression: 6.5 percent) The high incidence among students was noteworthy, probably as a result of several concerns about academic setbacks, financial support, and social isolation among this population. (Kexin Zhu, 2021)

#### 4.5 Difference between stress and anxiety

The Yerkes-Dodson law is shows how stress and performance are related. It tells us that a little amount of stress is always needed to get a task done. When the stress is too low or high then it is an issue.

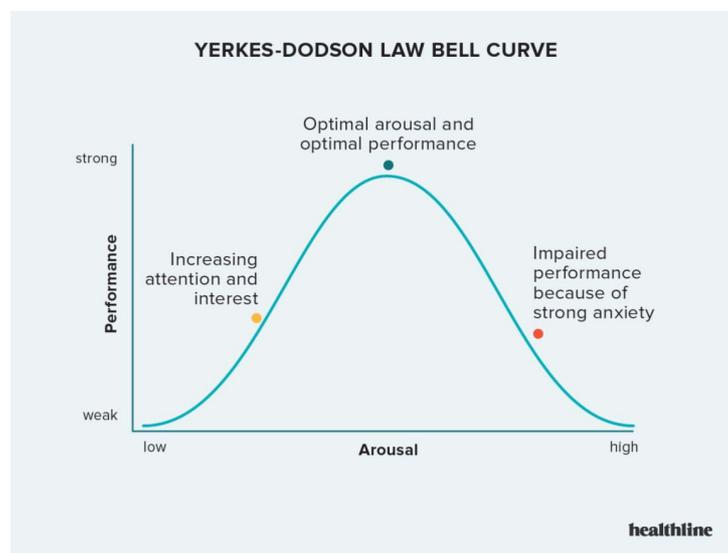


Figure 13: Yerkes-Dodson Law Bell Curve (Healthline, n.d.)

A fight, flight, or freeze reaction can be triggered by extreme stress. It's the season's final play, winner takes it all, and you're up to bat. It's a do or die project with the possibility to transform your life. It's an examination that could

prevent you from getting your degree. In such circumstances, tension and anxiety reach hazardously high stages. It is hostile, disturbing, and even nerve-racking. Focus is lost. You're well aware that you've put your money where your mouth is, yet it's working against you.

Pandemic exhaustion. It's a genuine thing: limited social activities, boredom, and a lack of structure may all sap your motivation.

On the other side, you may be unduly concerned about:

- you and your family's health
- a lack of work and the resulting financial difficulties
- the blending of work, school, and home areas
- unpredictability and managing future expectations
- a lack of physical exercise
- news overstimulation
- stress signs from others (Healthline, n.d.)

## 4.6 Grounding Techniques

These are a collection of easy techniques for separating yourself from emotional agony. It's a way of distracting yourself from the upsetting emotions that you're experiencing. Grounding can alternatively be described as centering, diverting, providing a safe space, or maintaining a healthy separation. When you're having a difficult day or coping with a lot of stress, overwhelming feelings, and/or acute anxiety, grounding is a self-soothing tool to apply. Grounding is a technique for staying in the present moment and reorienting yourself to the current moment and reality. It can also be used as a diversion from the problems you're having. (Hampshire, n.d.)

Along with the help of expert mental health expert Dr. Mahati Chittem and my college Mahima Dahekar grounding techniques were studied and put into buckets of can be performed alone (Beginner level) and need supervision (Advanced level).

**Table 1: Grounding Activities Bifurcation**

ALL	BEGINNER LEVEL	ADVANCE LEVEL
54321	B	
3-3-3	B	
369 METHOD		A (-)
4-7-8 BREATHING TECHNIQUE	B	
5X5	B	
ABC MODEL	B	

SQUARE/ BOX BREATHING	B	
WATCHING A PIECE OF ICE MELT	B	
PLAY A MEMORY GAME	B	
BELLY BREATHING		A
TAKE FIVE	B	
BREATH COUNTING	B	
IMAGINE DOME PROTECTING YOU		A
IMAGINE SUITCASE WITH ALL WORRIES	B	
DROP THE ROPE	B	
BODY SCAN		A
THINK IN CATEGORIES		A
PLAN WORRY TIME		A
SEPARATING THE PAST FROM THE PRESENT		A
COLOR BREATHING	B	

## 4.7 Cognitive Behavioral Therapy

Aaron T. Beck is credited with creating cognitive behavioral therapy, which is now widely utilized (CBT). In any history of CBT, Albert Ellis, who invented a type of cognitive therapy around the same time as Beck, is mentioned. Rational Emotive Behavior Therapy (REBT), which is similar to CBT in many aspects, arose from Ellis' work. (N.d., PsychologyTools)

CBT is a type of psychological treatment that works on many issues including anxiety. CBT has been more effective than, other forms of psychological therapy or psychiatric drugs in numerous trials. It is based understanding:

1. Unhelpful thinking.
2. Habits of unproductive behaviors .
3. Improving coping mechanisms (APA, n.d.)

CBT treats anxiety by assisting people in changing the way they think and behave when they are worried. CBT seeks to help people stop and change the anxious thoughts that feed their anxiety, as well as lessen avoidant actions. These adjustments, taken together, aid in the reduction of anxiety symptoms without the need of medicine, as well as the impact on their everyday life. (Choosing Therapy, 2022)

## Basic steps in the cognitive behavioural therapy

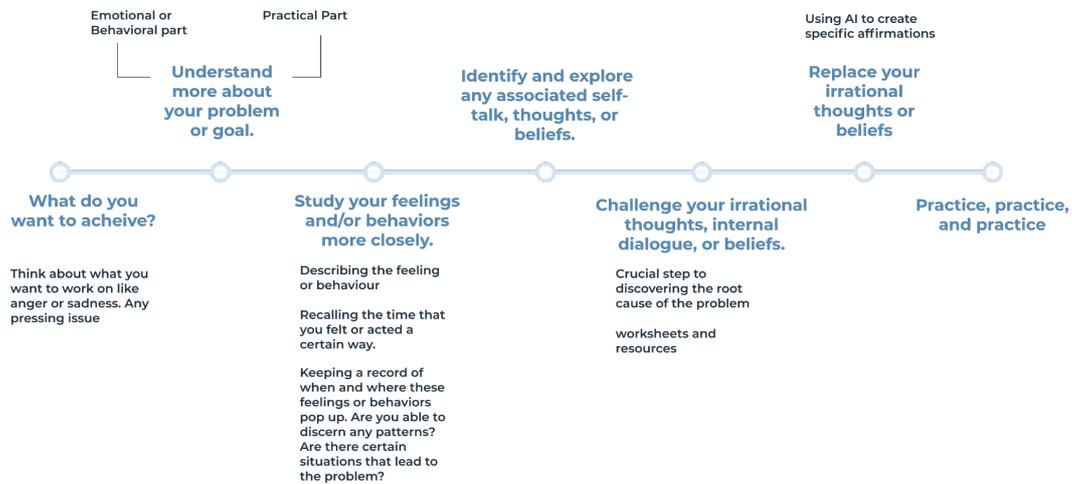


Figure 14: CBT Flow (Author, 2022)

## 4.8 Cognitive Distortions

The following characteristics are assessed while utilizing Cognitive behavioral therapy (CBT) with patients to check their beliefs regarding a specific trigger.

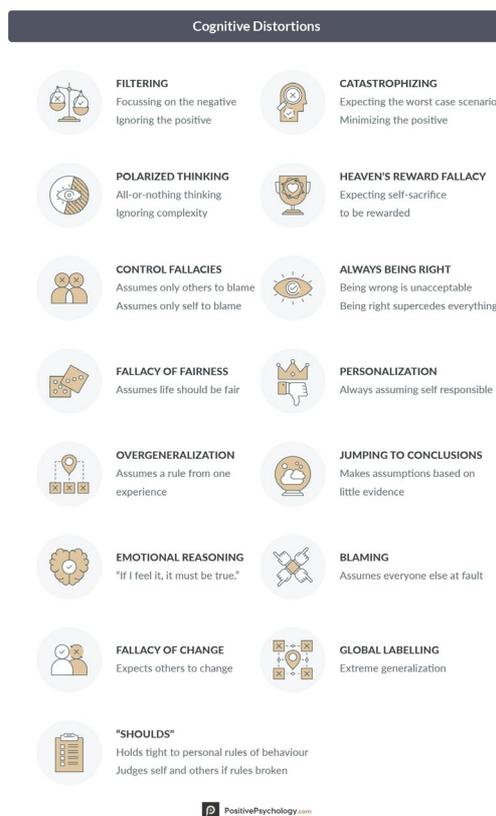


Figure 15: Cognitive Distortions (Courtney E. Ackerman, 2017)

## 4.9 Transactional Analysis

Eric Berne established Transactional Analysis (TA) as a psychoanalytic theory and therapeutic practice in the 1950s. People's communication interactions are referred to as transactions. (Murray, 2021)

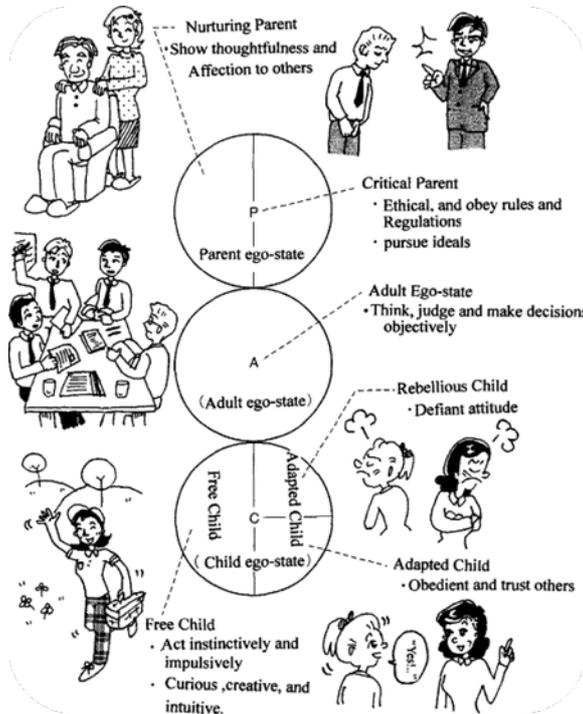


Figure 16: Transactional Analysis (SachikoShirai, n.d.)

All the transactions are necessary in our day to day lives however we need to check in what mode we go into. Adult ego is said to be the most effective for communications to go smoothly.

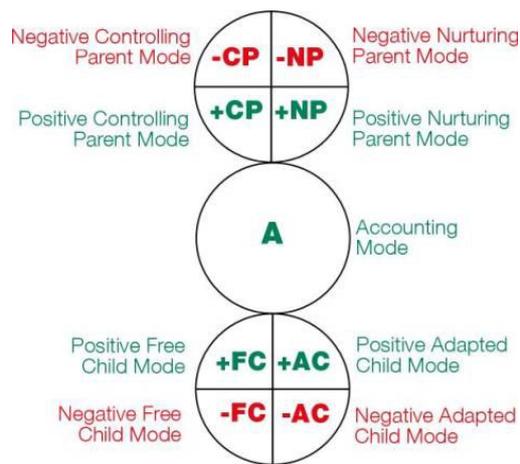


Figure 17: Positive and Negative Ego States (Soulselfhelp, n.d.)

#### 4.10 DARE Technique

Barry McDonagh is the creator of the DARE method. DARE response is a unique and simple approach to break free from anxiety and panic attacks. DARE is a four-step technique that comprises defusing, allowing, running toward, and engaging. DARE is a program that seeks to modify the way you think about anxiety and make it more bearable. (The Center for Growth, n.d.)

STEP 1: DEFUSE

STEP 2: ALLOW

STEP 3: RUN TOWARD

STEP 4: ENGAGE

#### 4.11 Games and Fidgeting

A few games and fidgeting toys were studied to understand how they help with anxiety management.

##### An Interactive Game to aid with Anxiety Management

This game is part of a small, but growing community of serious games designed to help people with learning and/or behavioral issues in a fun and participatory way. This suggests that there is a lot of room for advancement in the field of

psychological and behavioral diseases and engineering.

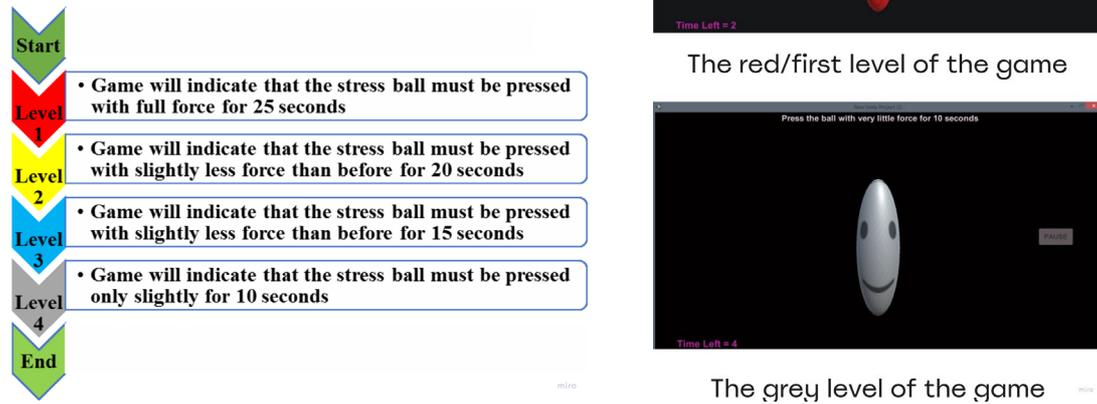


Figure 18: Game Example for Anxiety (Heyman, 2019)

## Fidget Toys

There are many fidgeting toys like spinner, rubik cubes, fidget balls etc that also help with restlessness which is a symptom of anxiety.

## 4.12 Yoga

Yoga and other physical workouts have been shown to help with anxiety in the long run. It also enhances your mental and physical wellbeing. Here are a few helpful positions. (Healthline, n.d.)

1. Hero Pose
2. Tree Pose
3. Triangle Pose
4. Standing Forward Bend
5. Fish pose
6. Extended Puppy pose
7. Child's pose
8. Head-to-Knee Forward Bend
9. Seated Forward Bend
10. Legs-Up-the-Wall pose
11. Reclining Bound Angle pose

### **4.13 Visualization for Anxiety**

We have the ability to use visualization techniques to control our nervous thoughts as humans. These mini-meditations have been shown in scientific studies to reduce anxiety and surge the performance. In reality, visualizations trigger similar neural networks that are activated during task, that helps to enhance the link between the brain and the body.

There are a few techniques that are useful.

1. The use of double-paned windows
2. Technique for creating a serene beach setting
3. Use of a stop sign
4. Using a blender
5. Yarn ball technique
6. Use of blue light
7. Silence is a fluid strategy. (Davidson, n.d.)

### **4.14 Gratitude**

Gratitude promotes neuronal modulation in the prefrontal cortex, which controls negative emotions, in the brain. It also stimulates the release of dopamine, a neurotransmitter that makes you feel happy. The end consequence is instant happiness, which encourages you to repeat the process.

Gratitude also reduces other anxiety symptoms, allowing you to cope with the disease more effectively:

- According to a study published in the National Center for Biotechnology Information in the United States, it aids in the treatment of insomnia.
- It promotes activity in the hypothalamus and has a good impact on biological processes, memory, and emotions by lowering stress hormones in the body. (rtor, n.d.)

Gratitude techniques such as journaling and group talks are increasingly a common feature of mental health interventions and life coaching regimes due to their anxiety-reduction benefits. (Madhuleena Roy Chowdhury, n.d.)

### **4.15 Mindfulness**

“Mindfulness is a mental state defined by nonjudgmental awareness of one's sensations, thoughts, physiological states, consciousness, and environment, as well as openness, curiosity, and acceptance.” (Ott MJ, 2006)

(Forsyth, 2016) Mindfulness treatment helps clients to:

- Stop attempting to cope with anxiety.

- Rather than experiencing anxiety as an emotion, feeling, thought, or experience, leave it alone.
- Not react to anxiousness, keeping it from taking control of their actions.
- Develop compassion for oneself and their emotional well-being.
- Get out of a recurring state of apprehensive discomfort.

They will learn to reap the following benefits (Shapiro, 2020):

- Mindful pause: a brief gap between stimuli and response that prevents automatic, typically negative, quick reactions.
- Witness state: a chance to take a step back and look at the scenario from a different perspective.

#### Mindfulness in Practice

By focusing on the present moment's experience, any action can become mindful. For example, you can either scarf down your dinner mindlessly or spend a few moments to practice mindful eating by looking at the food, smelling it, experiencing the varied smells and textures as you carefully eat it. It's no surprise that eating thoughtfully is more delightful and rewarding than eating mindlessly. When you begin eating thoughtfully, you will also notice that you consume less food. (Shelley Kind, n.d.)

### 4.16 Digital Detox

When we use our phones as a sort of distraction, we develop phone anxiety. They can even be a haven for us while we're experiencing anxiety in other aspects of our lives. "While diverting our focus away from unpleasant thoughts and stimuli can be beneficial for mental health, it does nothing to address the fundamental cause of the symptoms," Thomas explains. "Even more distressing, feelings of inadequacy that arise when watching the curated, edited, and filtered lives of others worsen anxiety symptoms."

The irony is that we frequently turn to our phones to relieve worry, only to consume stuff that exacerbates it. The cycle goes on and on. Are you ready to put an end to your phone phobia? Try out the seven tips below to kick it to the curb.

1. Take a clean break
2. Do a digital cleanup
3. Create Boundaries
4. Prioritize
5. Engage Purposefully
6. Make a 'happy space'
7. Unfollow liberally

## 4.17 Existential Psychology

To understand mental well-being better and for in-depth research I have audited the course LA1420- Existential Psychology. While studying I have been introduced to existential givens like freedom, isolation, meaninglessness, death by Yalom. Existentialism is a state of being, a continued survival. Soren Kierkegaard talks about how taking decisions based on our own makes us authentic instead of being dependent on other individuals, groups or institutions. Viktor Frankl has proposed that leading an authentic life instead of going in to crisis can be possible in 3 ways:

- Affirming meaning through a leap of faith,
- Evaluating and reconstructing one's system of meaning
- Embracing meaninglessness

## 4.18 Panic Attacks

An acute episode of abrupt dread that occurs when there is no visible threat or danger is known as a panic attack. You could mistake the symptoms of a panic attack for those of a heart attack in some situations. You could have a single panic attack. Alternatively, you may experience several panic episodes over the course of your life. Recurrent panic attacks — and the fear of experiencing them — may cause you to avoid other people or public areas if left untreated. It's possible that you've got a panic condition as a result of this. (Healthline, n.d.)

What to do in case of a panic attack?

1. Seek counseling
2. Use deep breathing
3. Recognize you are having a panic attack
4. Close your eyes
5. Practice Mindfulness
6. Find a focus Object
7. Use muscle relaxation techniques
8. Picture your happy place
9. Engage in light exercise
10. Keep lavender on hand
11. Repeat a mantra internally

## 5. Design Brief

After primary research it was determined that anxiety is the mental health issue most prominent among the age group of 18 to 24 years of age. Considering anxiety, the aim was to help young adults understand, recognize and improve their mental wellbeing by healing the anxiousness using an intelligent personalized solution. The first phase would compose of designing a desktop-based web solution where the current AI works smoothly. It would be tested with a pool of users to understand the pain points and then rectified for second phase along with a mobile app. People suffering from anxiety need to feel calm and a lot of reassurance, hence the interface needs to reflect the same. The main goal would be to create a comfortable environment through a web solution that would bridge the gap to therapy as a friendly solution.

## 6. Experience Design

### 6.1 Working of the intelligent system for anxiety

Currently the intelligent system used at IBY is only detecting emotions. To make it refined for detection of anxiety we need to include detection of anxiety symptoms like:

1. Heart rate
2. Restlessness
3. Nail-biting
4. Hair pulling
5. Scratching
6. Hand tapping
7. Hyperactive behaviors
8. Obsessive compulsions
9. Lack of energy
10. Lack of appetite
11. Sleeping more or less

Existing model is in the left and the right posture detection has been an addition for anxiety as per the literature study conducted.

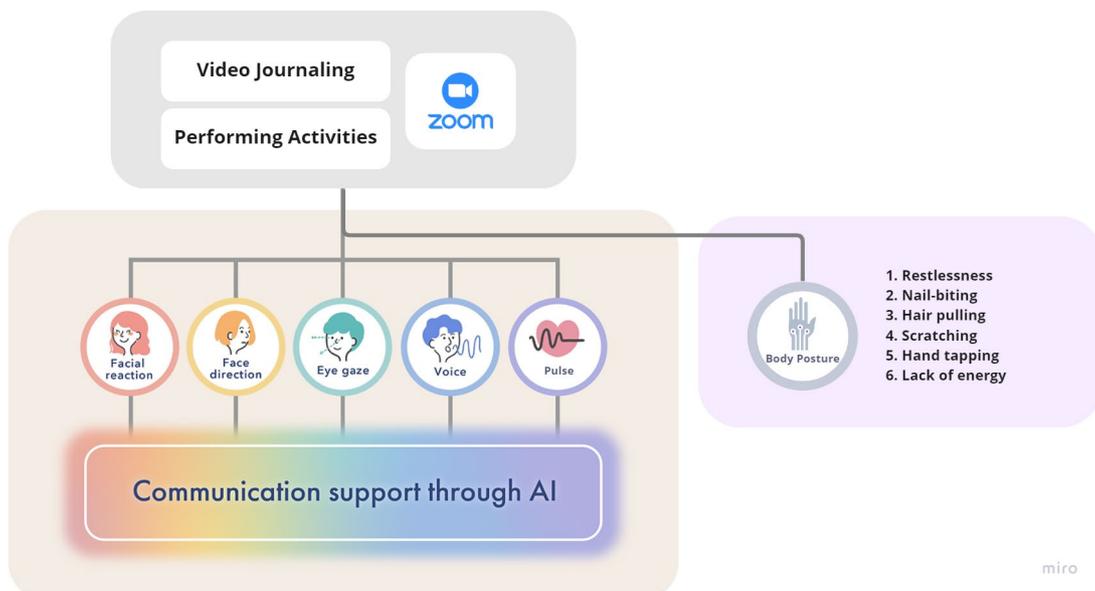


Figure 19: Anxiety Detection Architecture

Data processing pipeline currently used in IBY

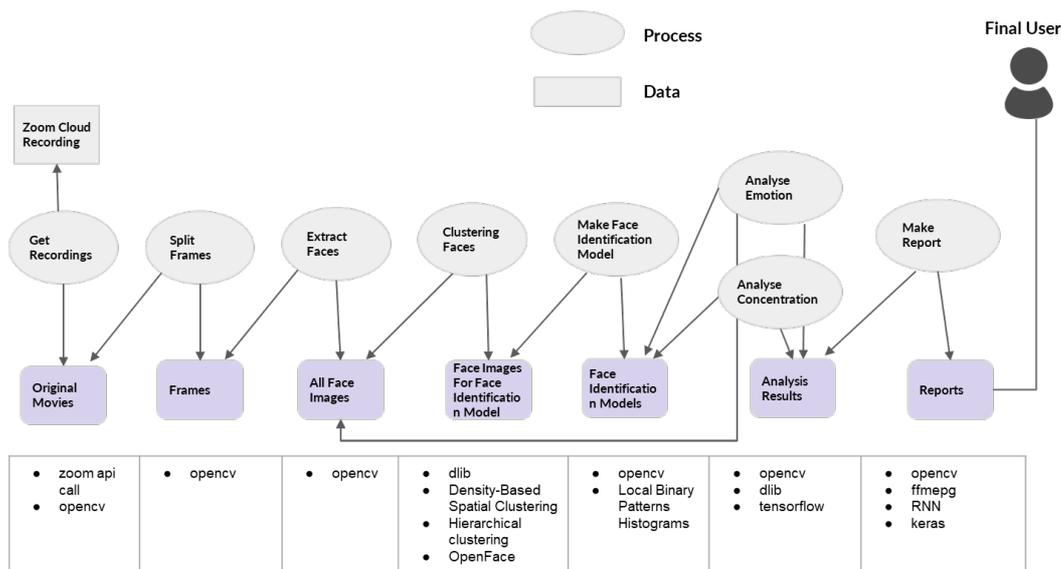


Figure 20: Data Processing Pipeline used in IBY

## 6.2 Information Architecture

Based on the literature survey and in consultation with therapists a solution was derived to introduce users to healing with a high level 3 step package. To make it clearer for users the healing will have packages according to the results of the users from the GAD-7. These packages will consist of grounding techniques, therapy-based healing and activities. The dashboard will be a personalized space as per each user's choice.

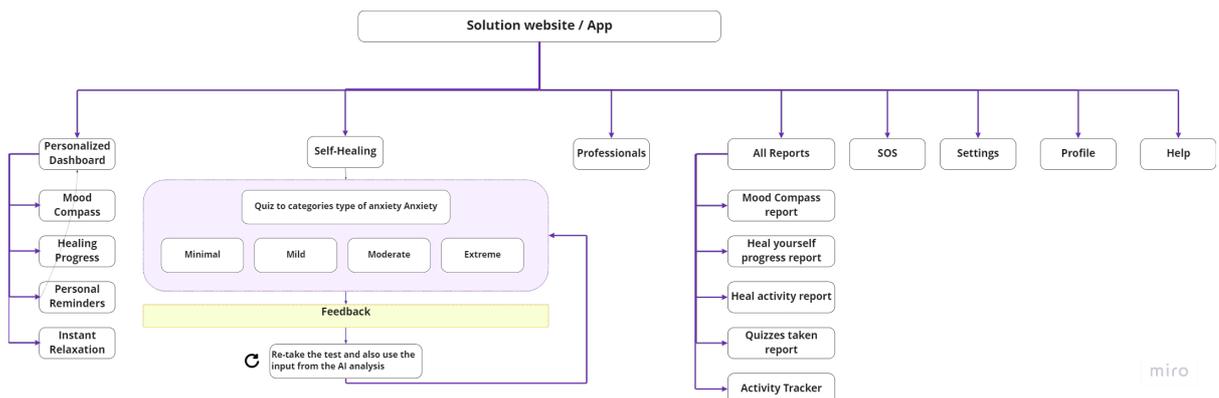


Figure 21: Information Architecture

## 6.3 Selected Solutions for Self-Healing

### Types of Solutions

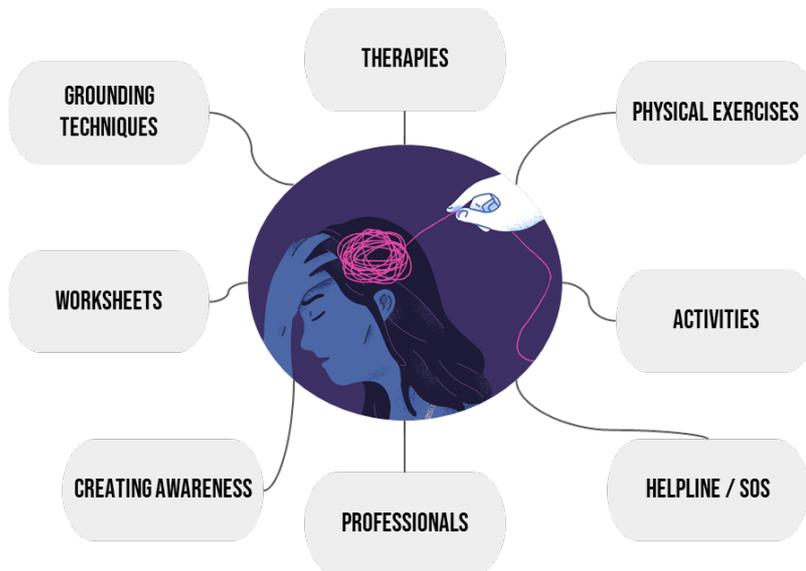


Figure 22: Types of solutions

### Specific techniques, therapies and activities

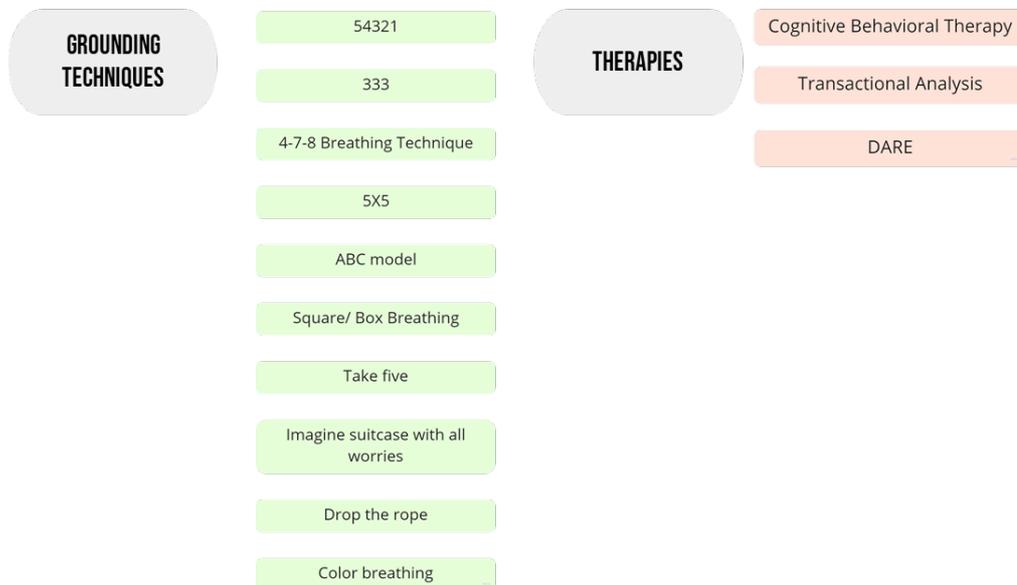
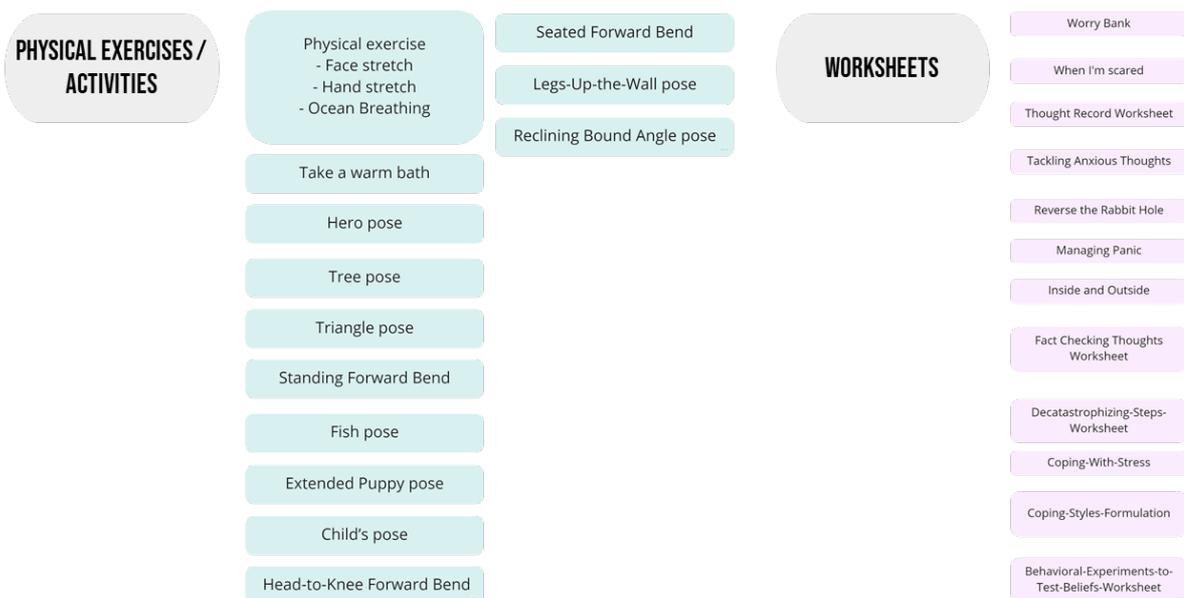
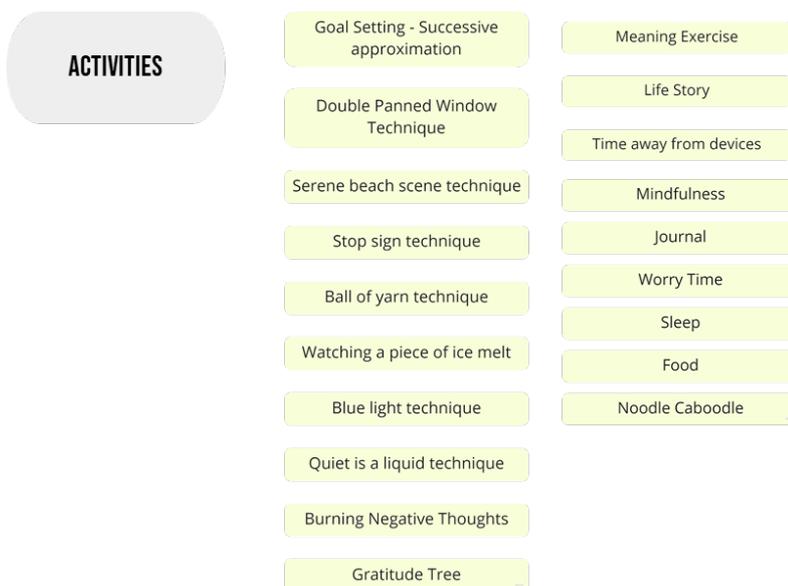


Figure 23: Grounding Techniques and Therapies



**Figure 24: Physical Exercises and Worksheets**



**Figure 25: Activities**

## 6.4 Designing healing packages to according to anxiety levels



Figure 26: Rough package creation

The above is a rough selection of activities for each of the anxiety levels. This will help all types of users to get healing.

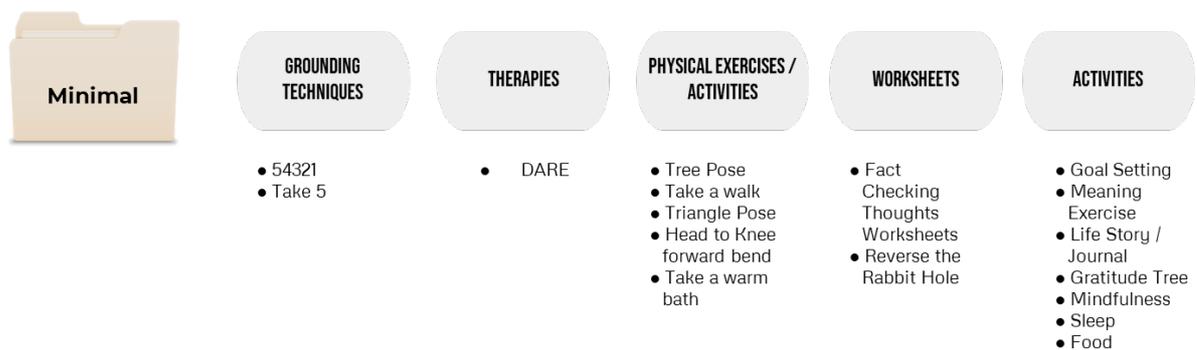
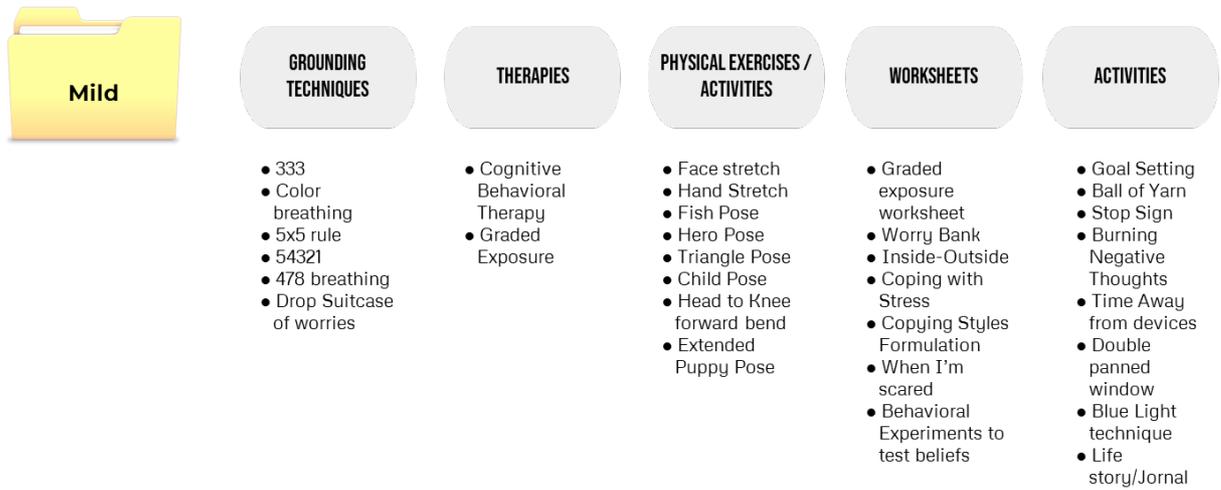
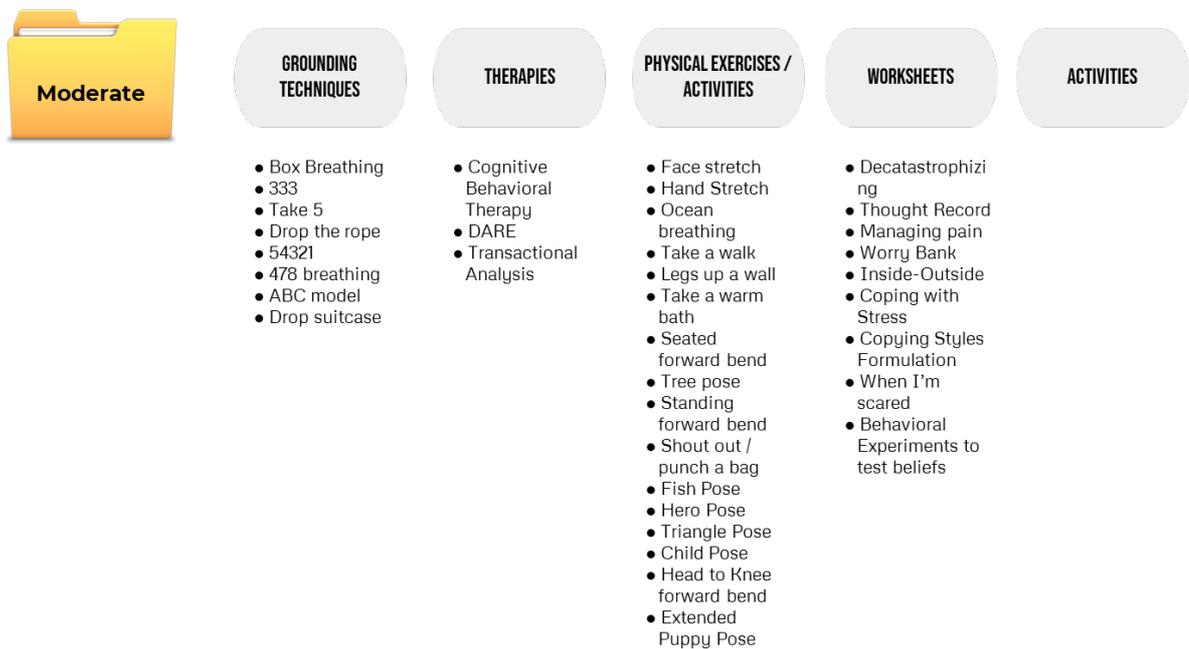


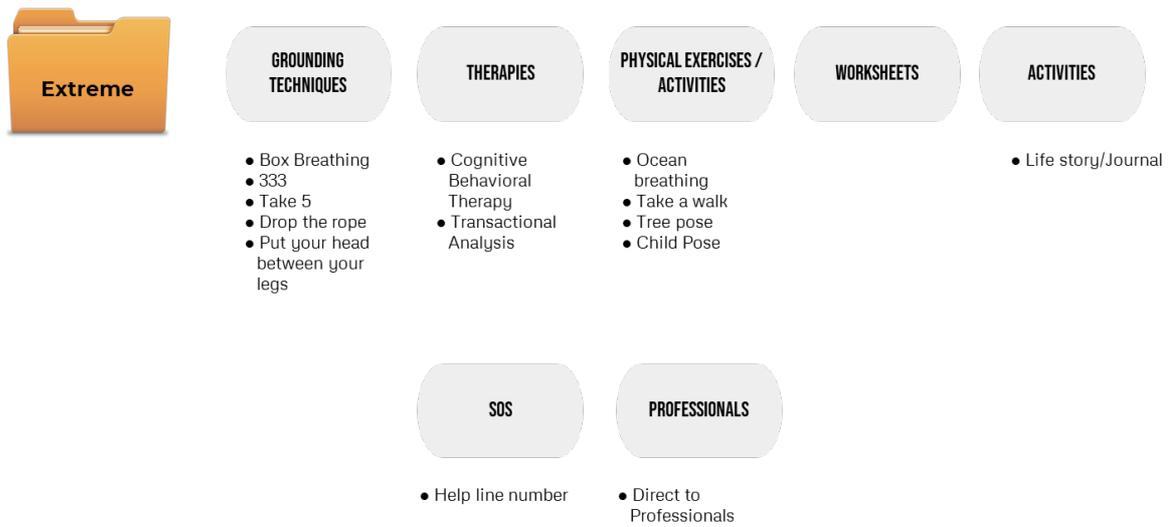
Figure 27: Minimal Package



**Figure 28: Mild Package**

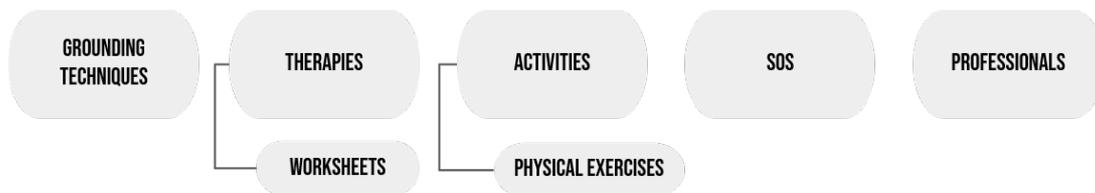


**Figure 29: Moderate Package**



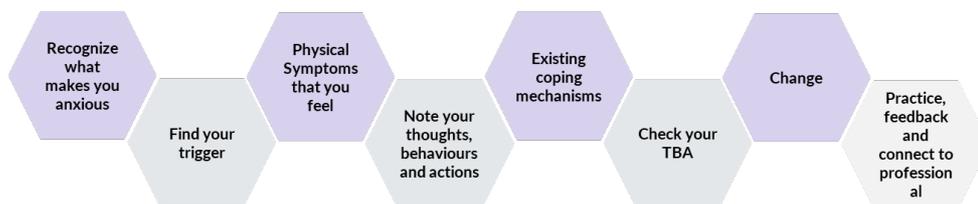
**Figure 30: Extreme Package**

Instead of having so many solutions the packages were then simplified as below:



**Figure 31: Simplifying Packages**

## 6.5 CBT and narrowing triggers



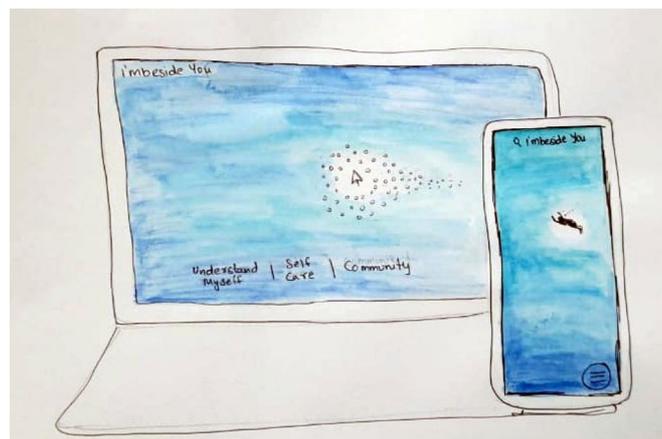
**Figure 32: CBT customized flow for website**

**Table 2: Situations and Triggers**

Recognize Situations	Studies	Career	Parents	Friends	Social Situations	Relationships	PTSD due to Covid-19
Triggers	Subject	Cracking an interview	Overprotective	Self - centered	Speech / Presentation	Abusive	Currently affected
	Teacher	Resume	Strict	Not able to make friends	Stage performance	Not trustworthy	Loss of a loved one
	Exam	Salary	Dominating	Dominating	Social gatherings	Violence	Health issues
	Homework / Assignment / submission	Confidence / Speaking skills	Physically abusive	Peer pressure to drink / smoke / drugs	Meeting new people or even known people	Peer pressure to be in a relationship	Fear of covid
	Test / Quiz	Place of work	Intrusive / no personal space	What do they think of me	What do they think of me	Disrespect	
	Grades	Comparison with others	Divorced parents	Untrustworthy friends		Rejection / fear of rejection	
	Study Material	Grades	Parental pressure to be married	Rejection		Feeling unworthy / bad self image	
			Parental pressure for grades or career			No approval from parents	

## 6.6 Explorations

A few explorations for the welcome screen on based on either having a calm view or giving information about what anxiety is and how this solution can help users.



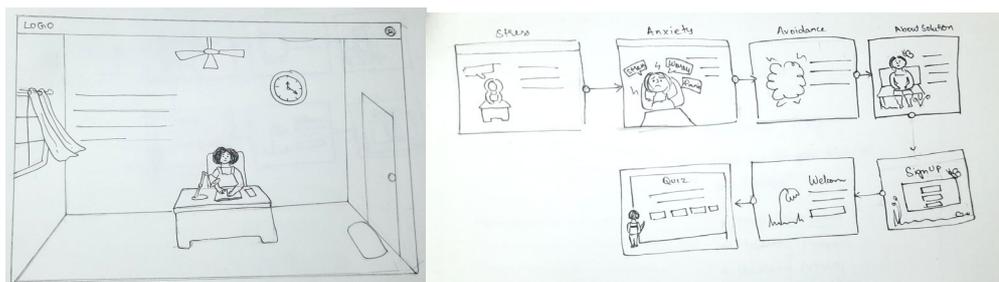
**Figure 33: Exploration with calming blue water effect**



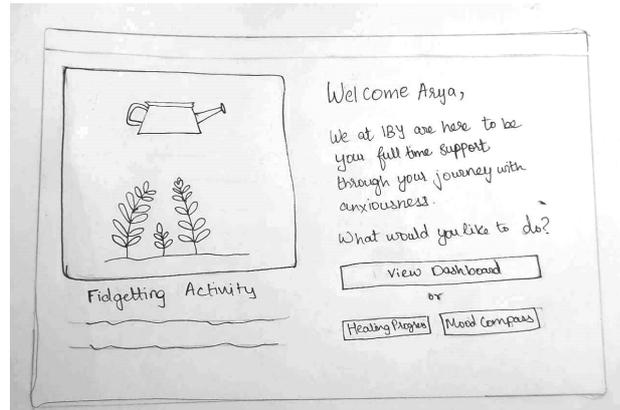
Figure 34: Exploration with minimal options



Figure 35: Exploration with a car journey onboarding



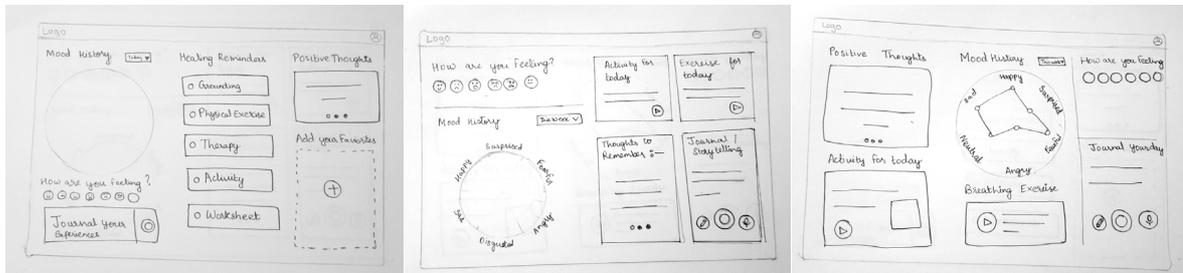
**Figure 36: Exploration with a story board on explaining about what is anxiety**



**Figure 37: Exploration of Welcome Screen**

## 6.7 Rough Wireframes

Based on the literature survey and in consultation with therapists a solution was derived to introduce users to healing with a high level 3 step package. To make it clearer for users the healing will have packages according to the results of the users from the GAD-7. These packages will consist of grounding techniques, therapy-based healing and activities. The dashboard will [have the overview of adding emotions or other activities and also having a few updates about the progress in healing.



**Figure 38: Rough Dashboard Options**



Figure 39: Rough wireframe Grounding Activities

Cognitive Behavioral theory-based flow.

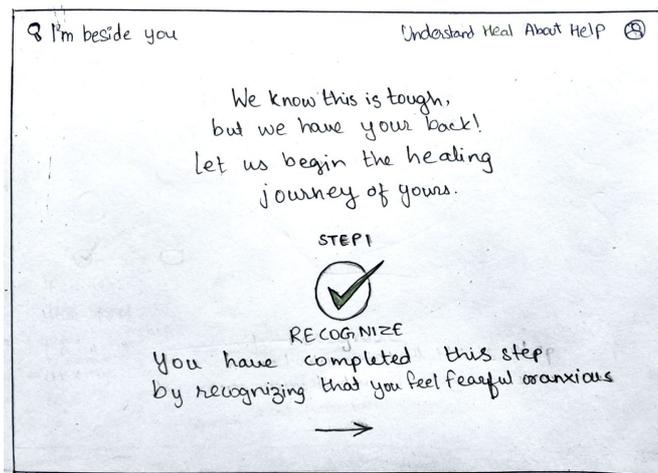


Figure 40: Rough wireframe CBT step1

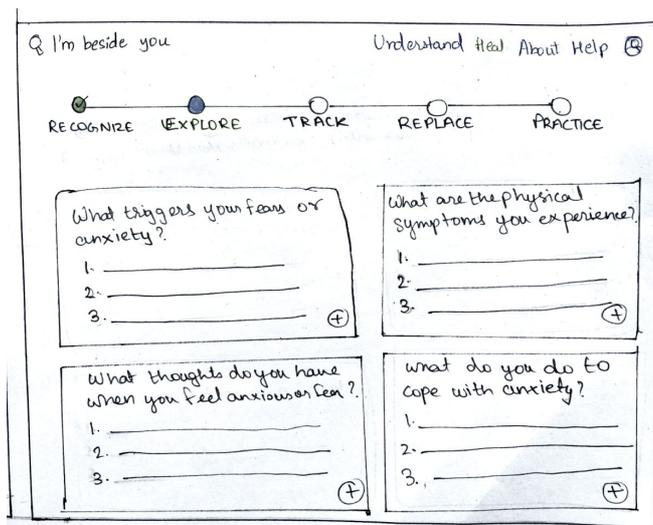


Figure 41: Rough Wireframe CBT step 2

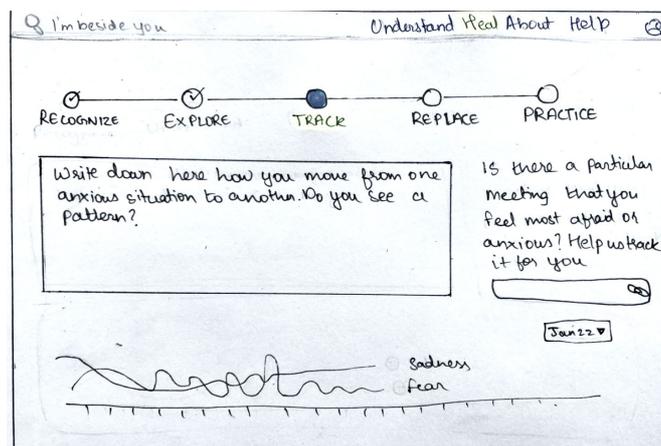


Figure 42: Rough Wireframe CBT step 3

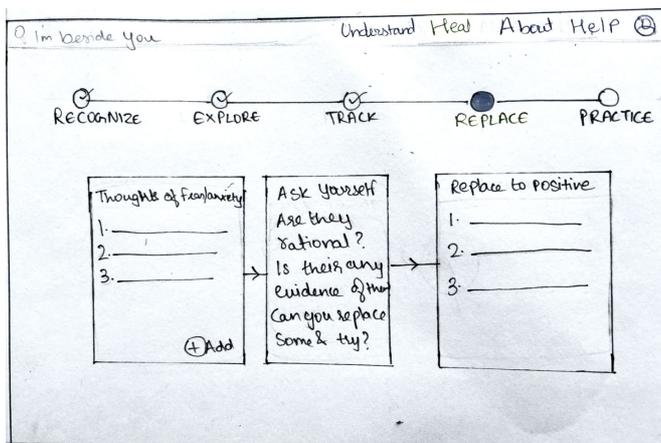


Figure 43: Rough Wireframe CBT step 4

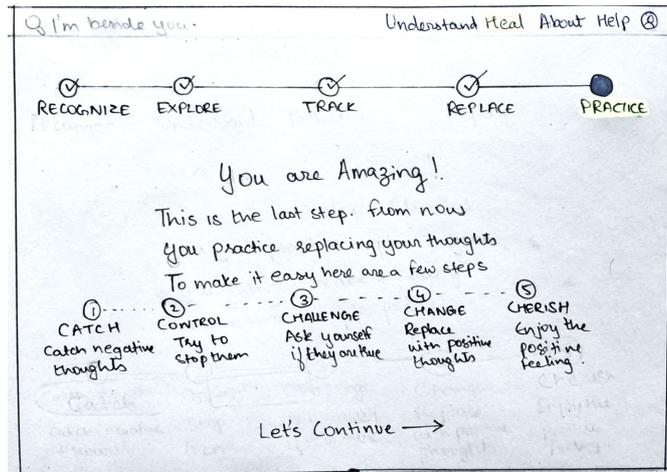


Figure 44: Rough Wireframe CBT Step 5

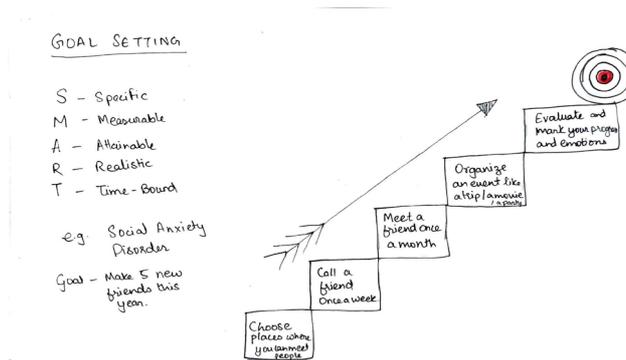


Figure 45: Rough Goal Setting

Burn Your Negative Thoughts

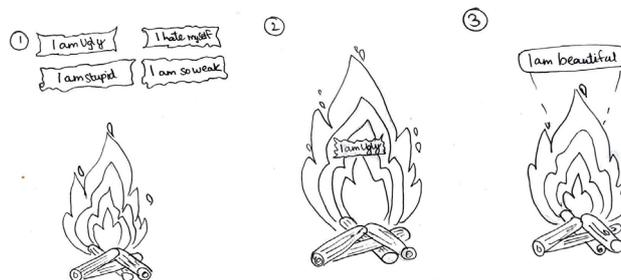


Figure 46: Rough Burn Negative Thoughts

7 GRATEFULNESS ACTIVITY

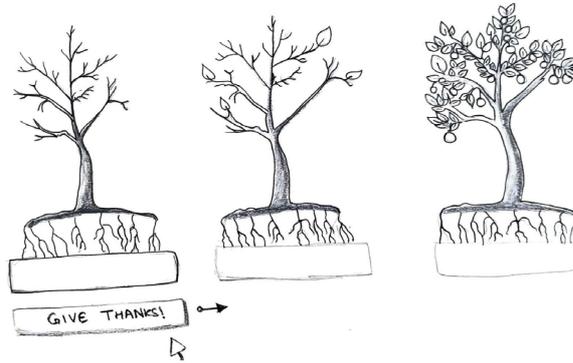


Figure 47: Rough Gratefulness Activity

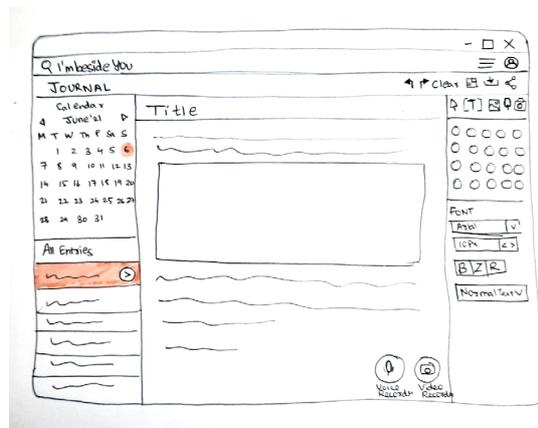


Figure 48: Rough Gratitude Activity

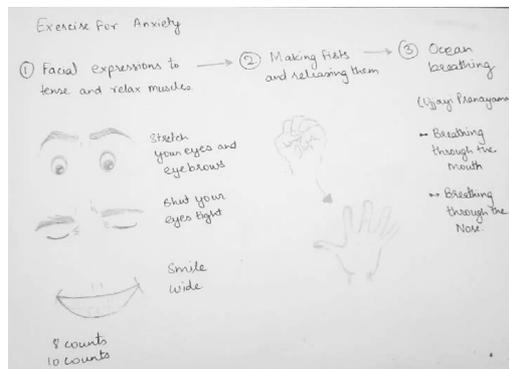
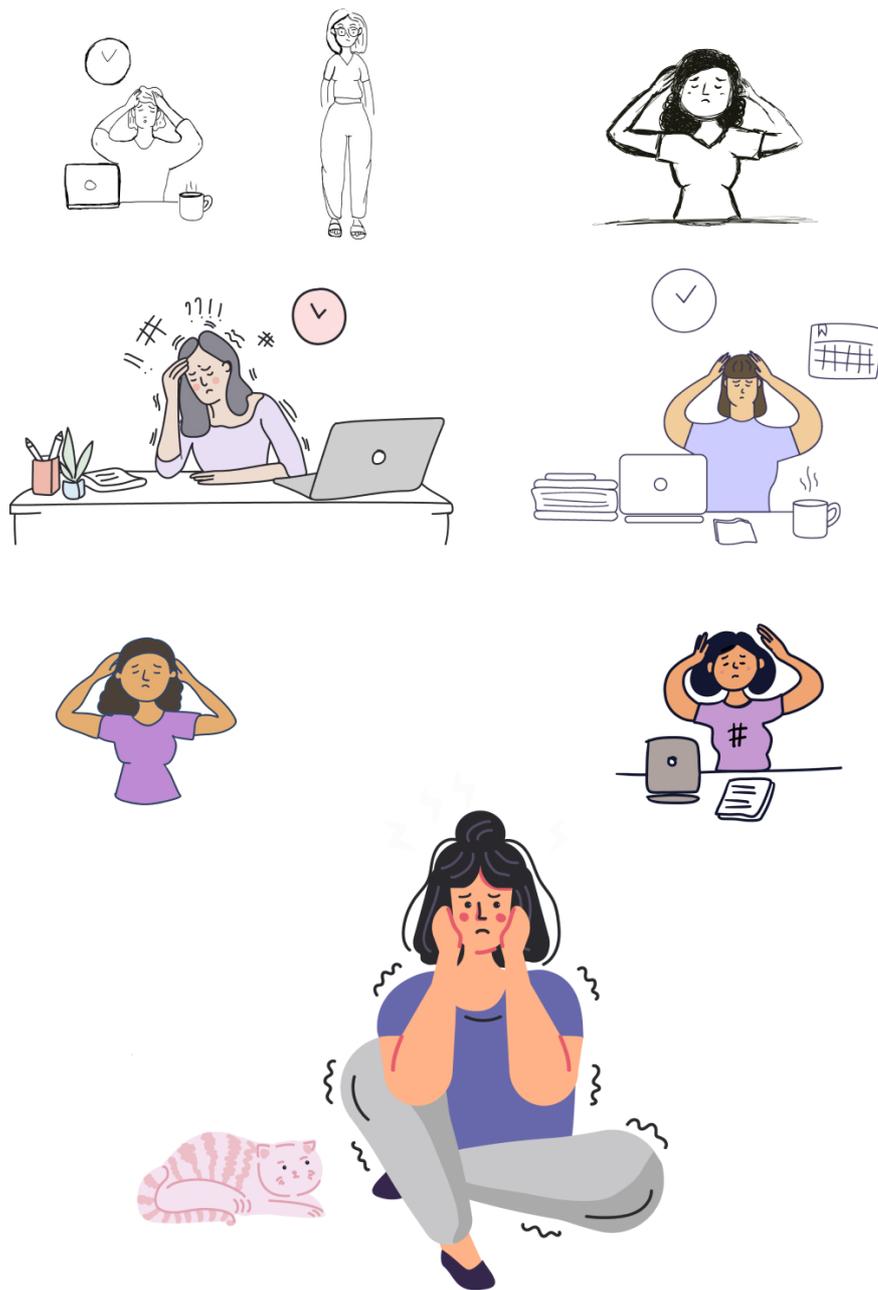


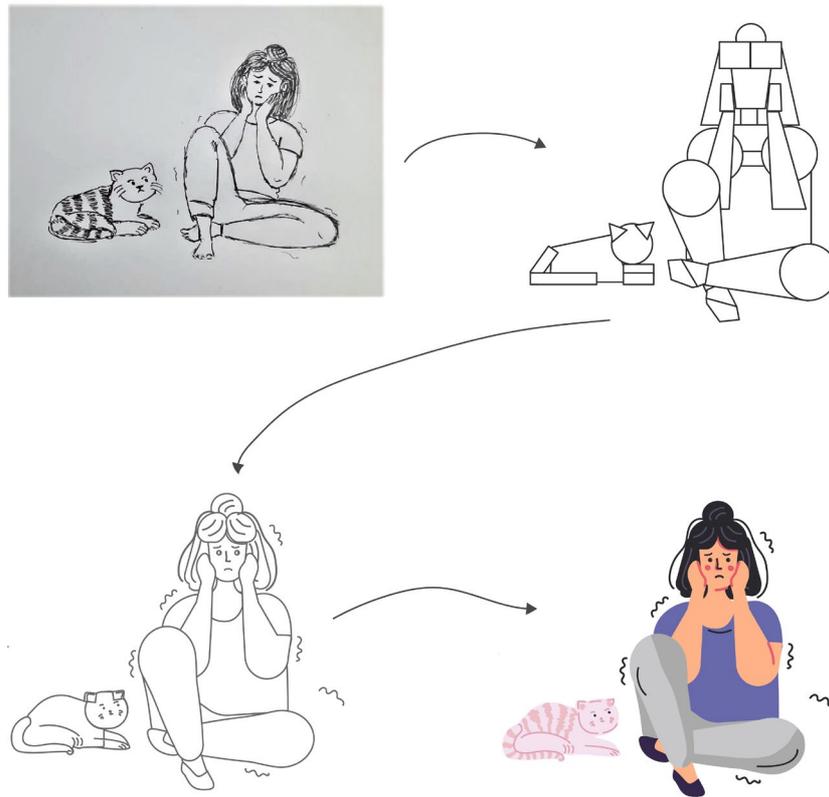
Figure 49: Rough Anxiety Exercise

## 6.7 Illustration Explorations

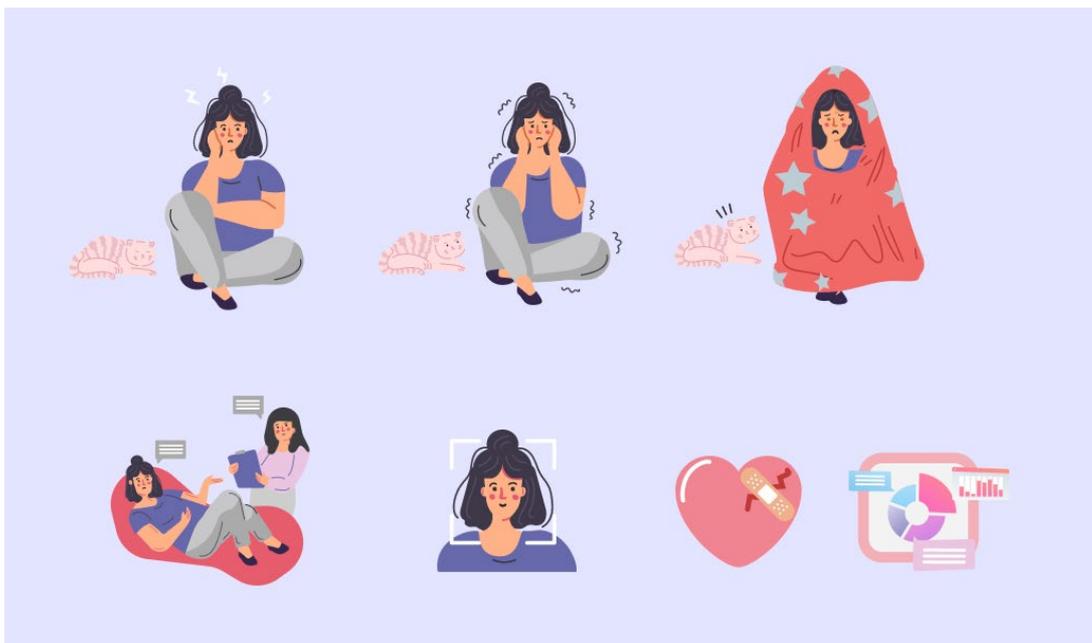
A few illustration styles were tried out and opinions of experts and users were sort out before finalizing the style to be used.



**Figure 50:Illustration Explorations**



**Figure 51: Process of creating final illustration**



**Figure 52: Welcome Page Illustrations**

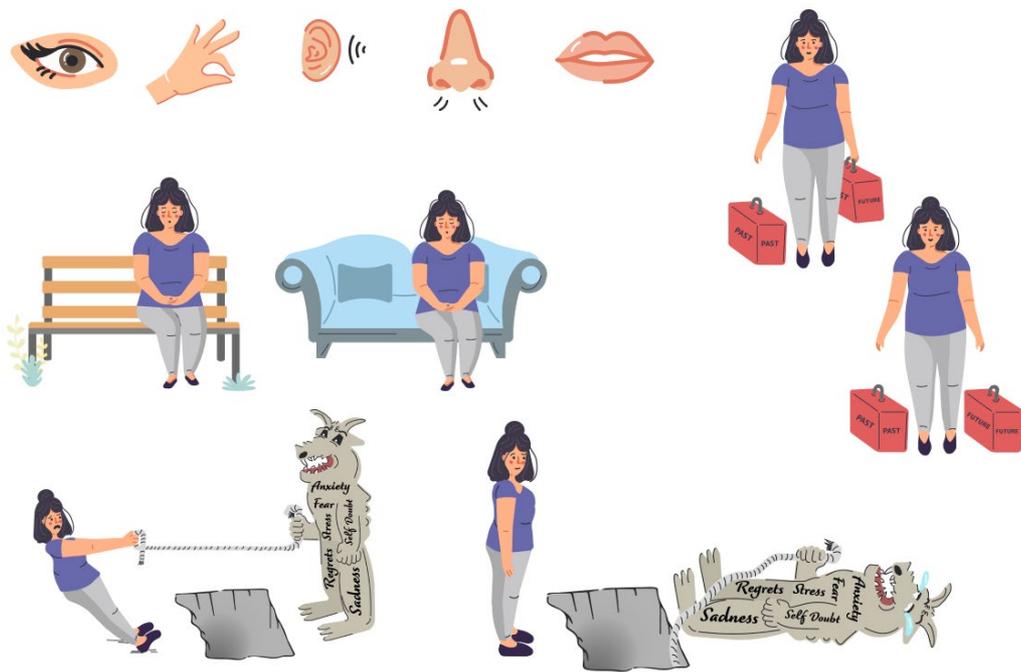


Figure 53: Grounding exercise Illustrations

CBT - Practice

① Cue in



Observe your thoughts

② Catch



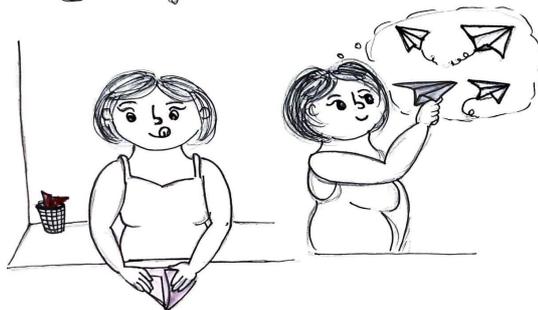
Catch your negative thoughts

③ Challenge



Read your thought aloud  
Ask yourself is there any proof  
there? Are they  
thoughts?

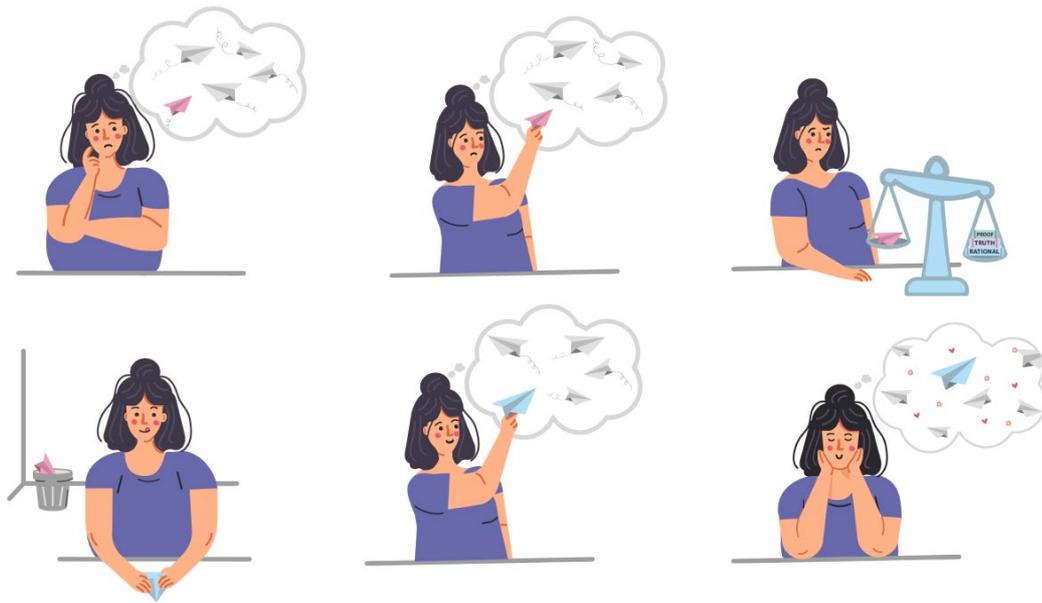
④ Change



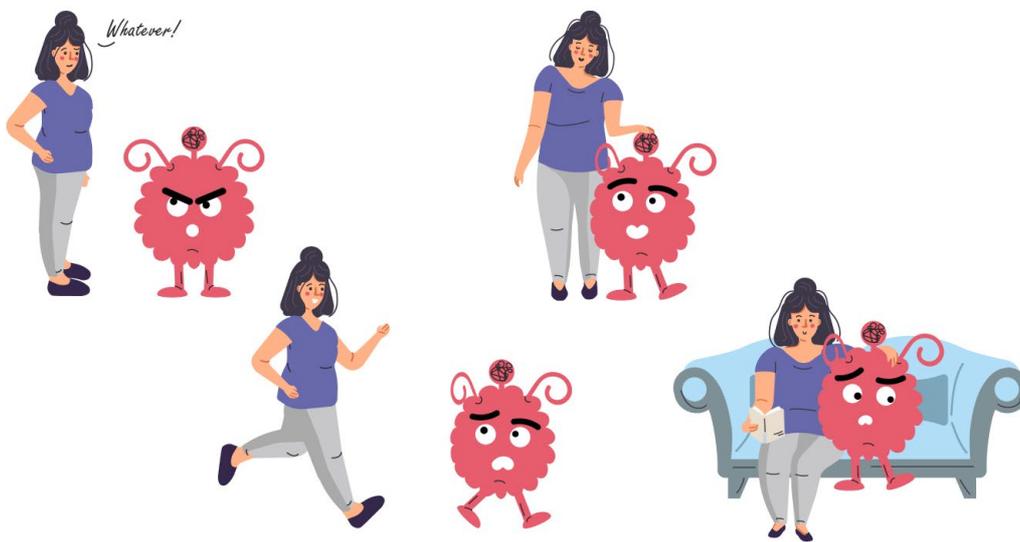
Replace with positive  
affirmative thoughts

⑤ Cherish





**Figure 54: CBT Sketches and Illustrations**



**Figure 55: DARE technique Illustrations**

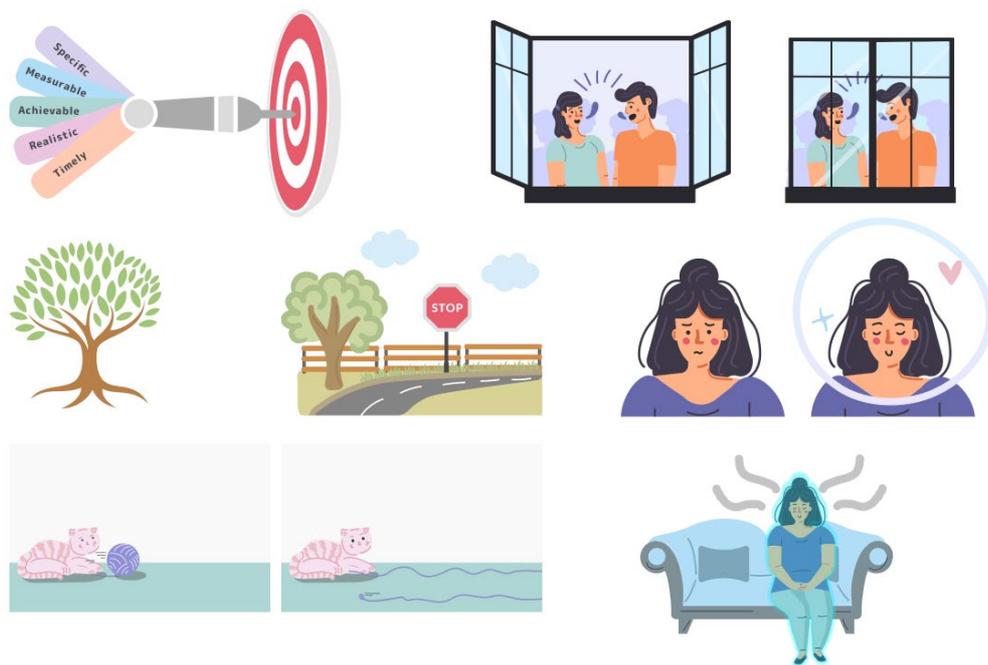


Figure 56: Illustrations of Activities

## 6.8 Color Palette

Colors were chosen based on best options for mental health and anxiousness.

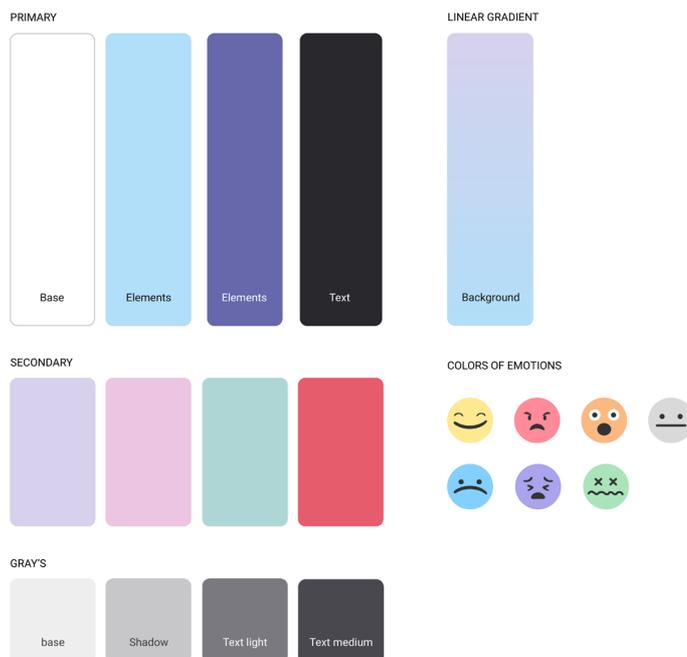


Figure 57: Colors

# Poppins

ABCDEFGHIJKLMNOPQRSTUVWXYZ  
abcdefghijklmnopqrstuvwxyz

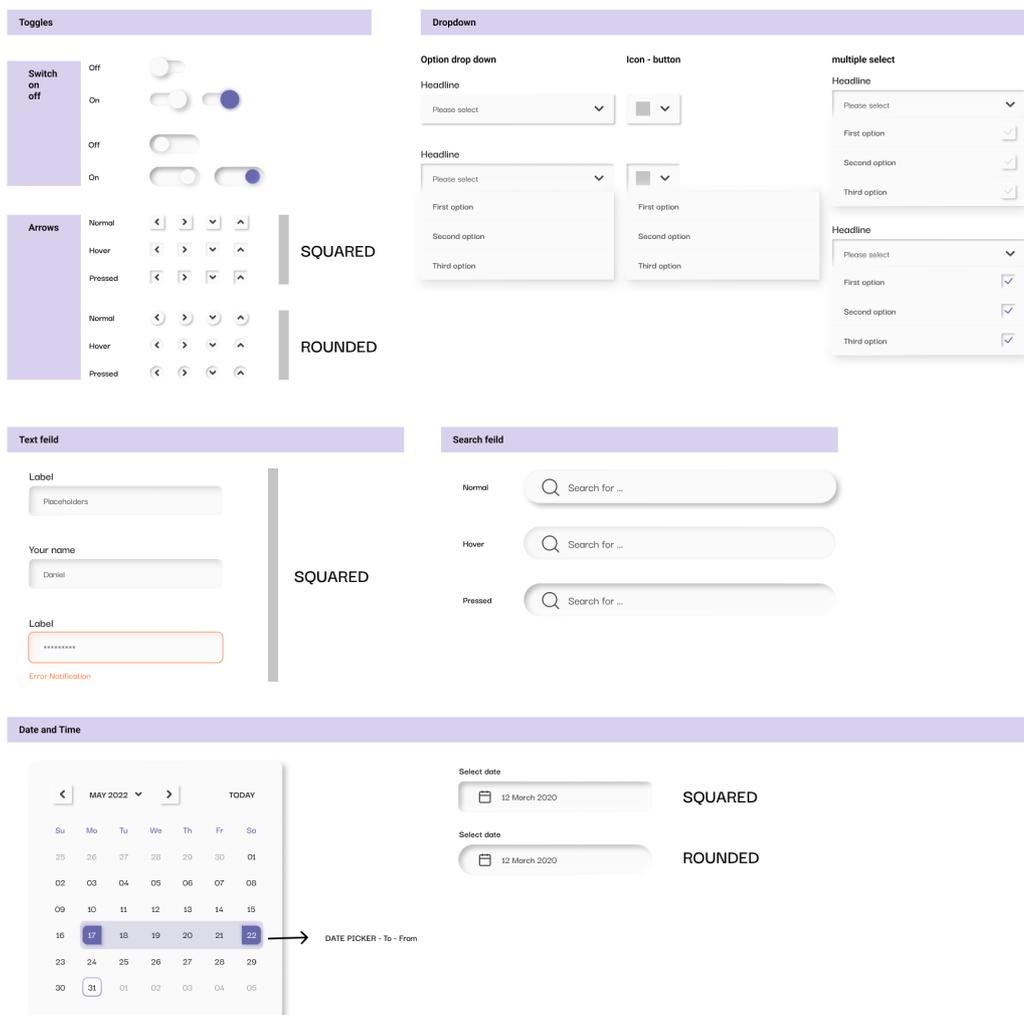
**BOLD** MEDIUM REGULAR LIGHT THIN

A a

Figure 58: Typography

## 6. 10 Component Design

The component design was inspired by neomorphism. This style was chosen as the components look very clickable due to the use of shadows. This will help user to easily understand which is the button among all the different elements on the page like text or images.



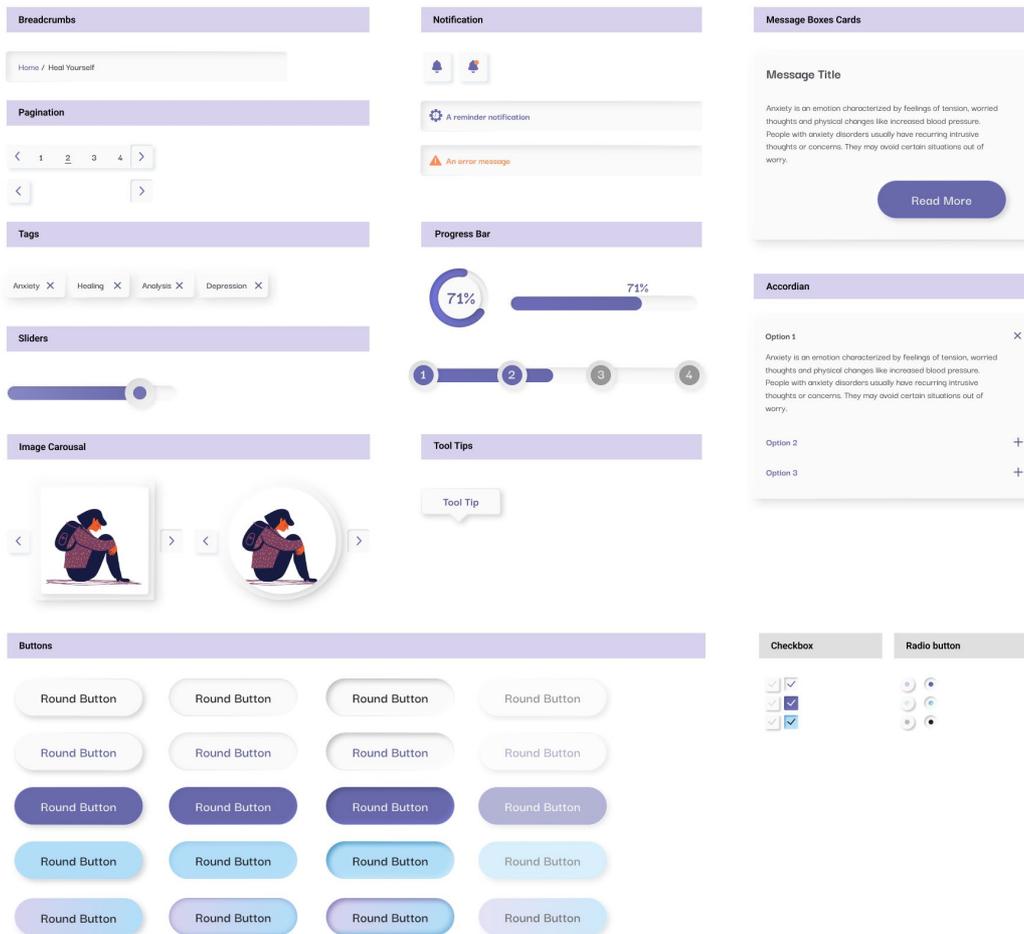


Figure 59: All Components

## 6.11 Website Design

### Welcome Screens

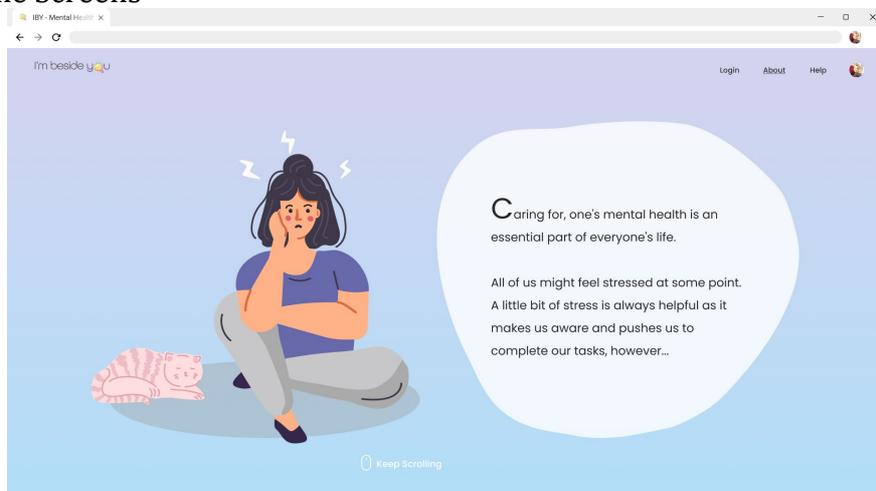
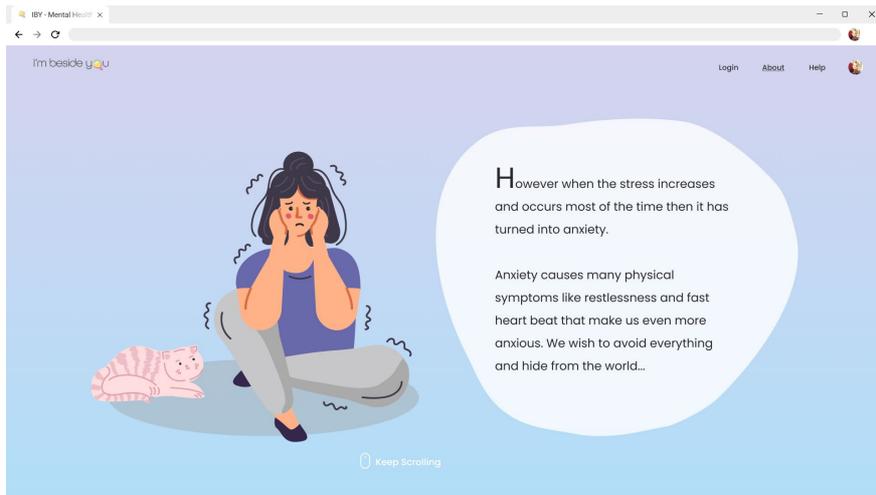
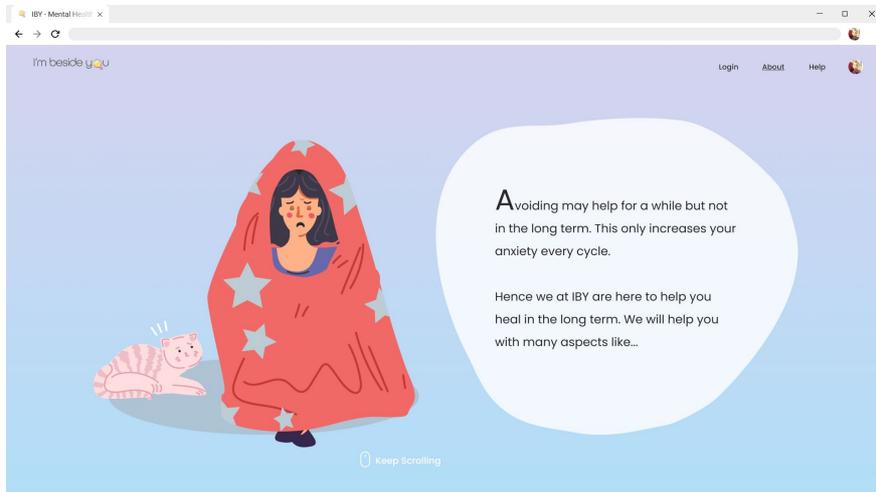


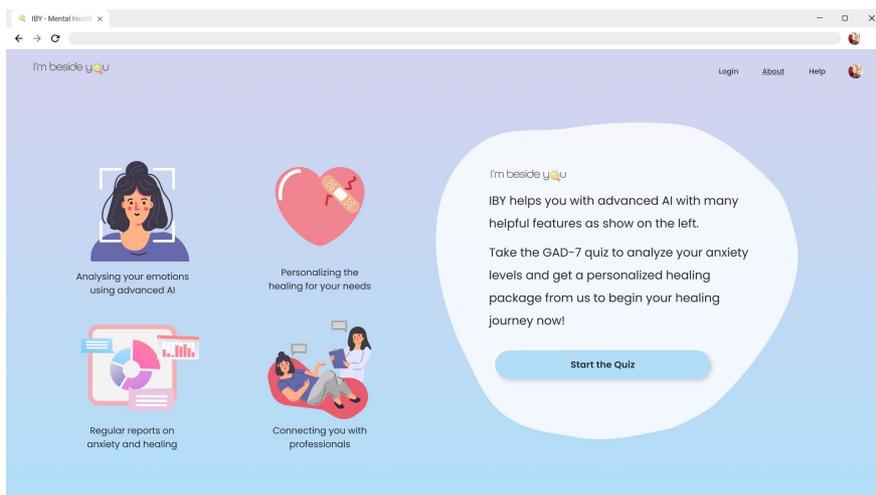
Figure 60: Welcome Screen 1



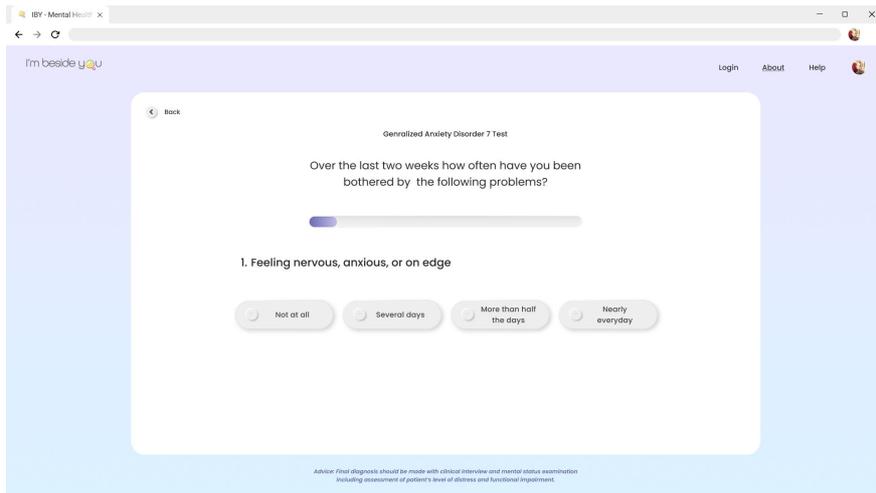
**Figure 61: Welcome Screen 2**



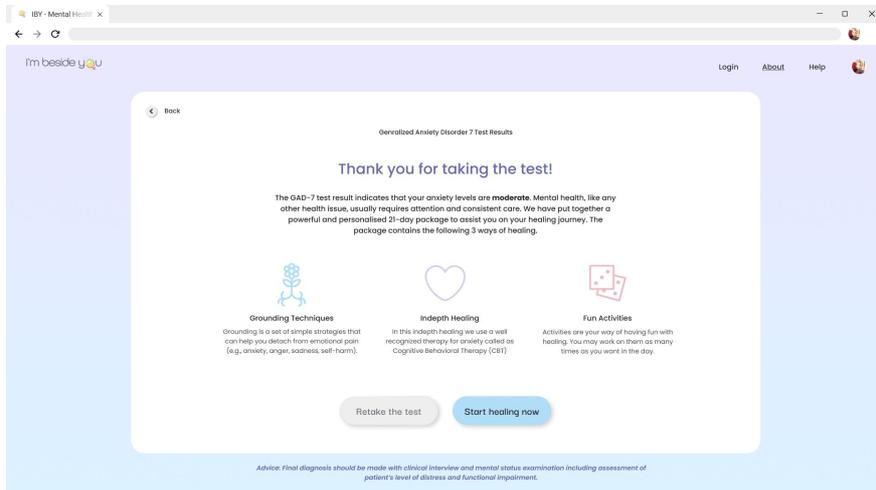
**Figure 62: Welcome Screen 3**



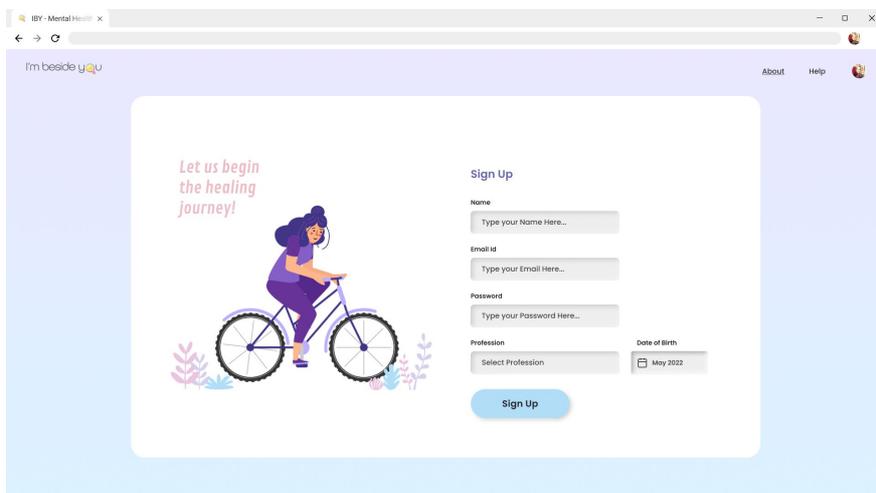
**Figure 63: Welcome Screen 4**



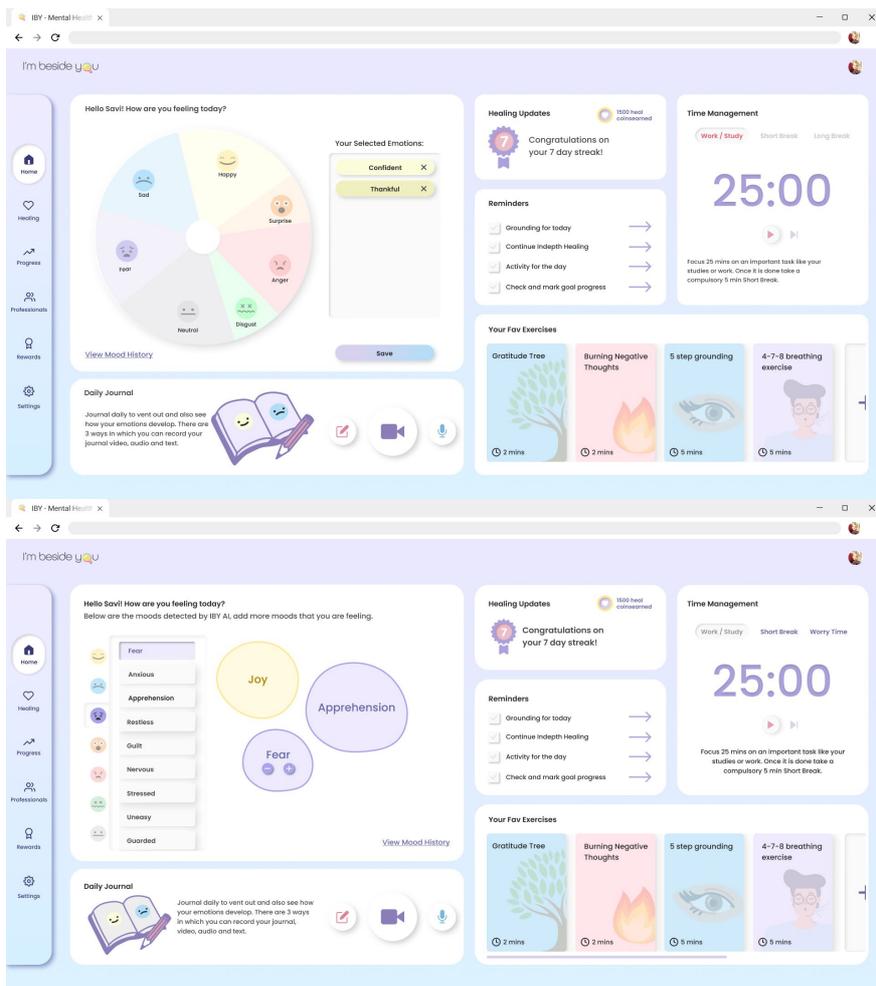
**Figure 64: GAD-7 Test Screen**



**Figure 65: Test Result**



**Figure 66: Sign Up Screen**



**Figure 67: Home Screen Options**

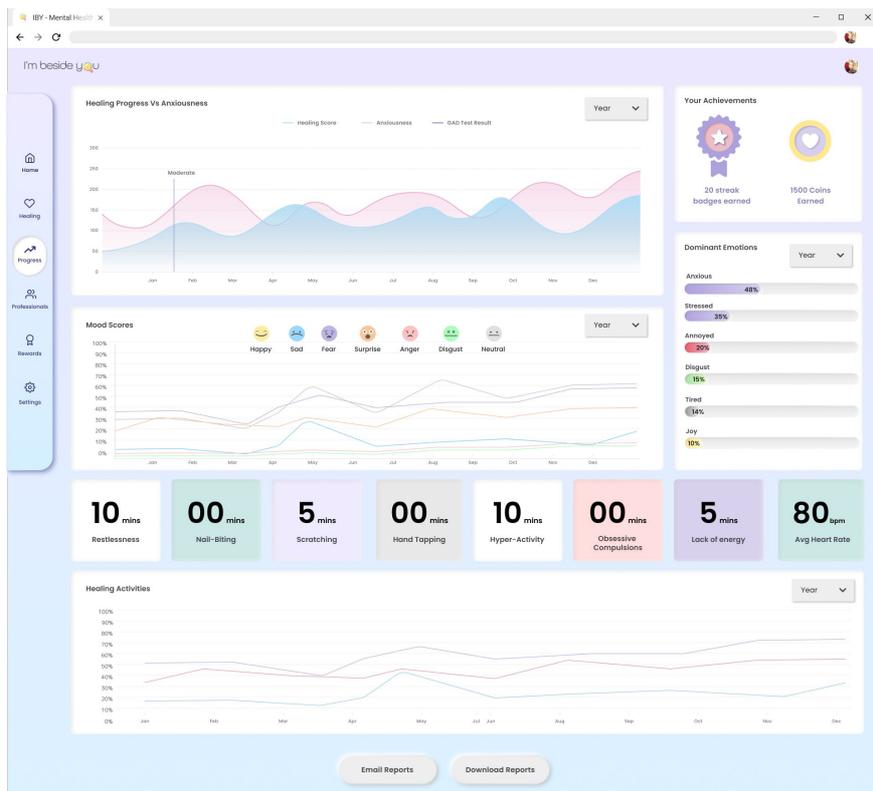


Figure 68: Report Screen

## Grounding Techniques

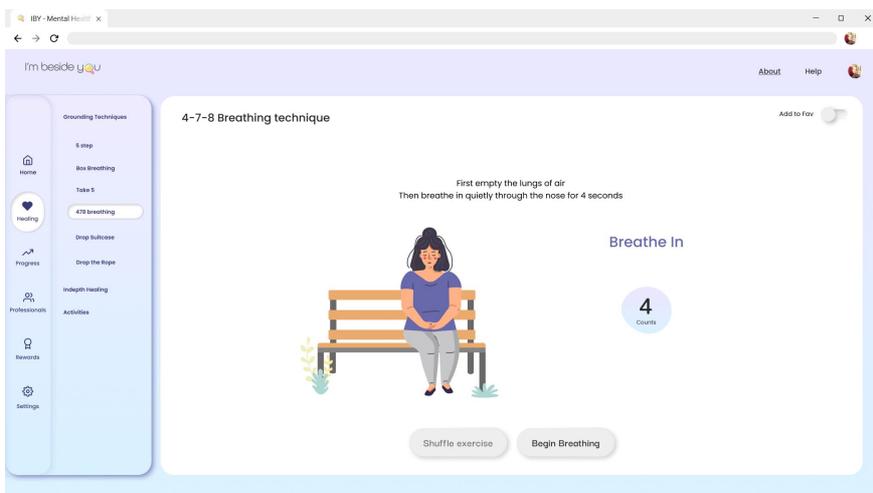
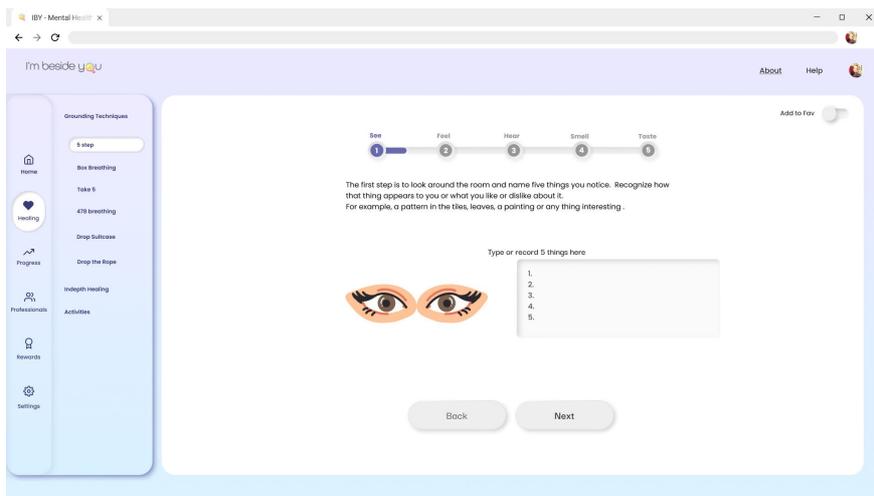


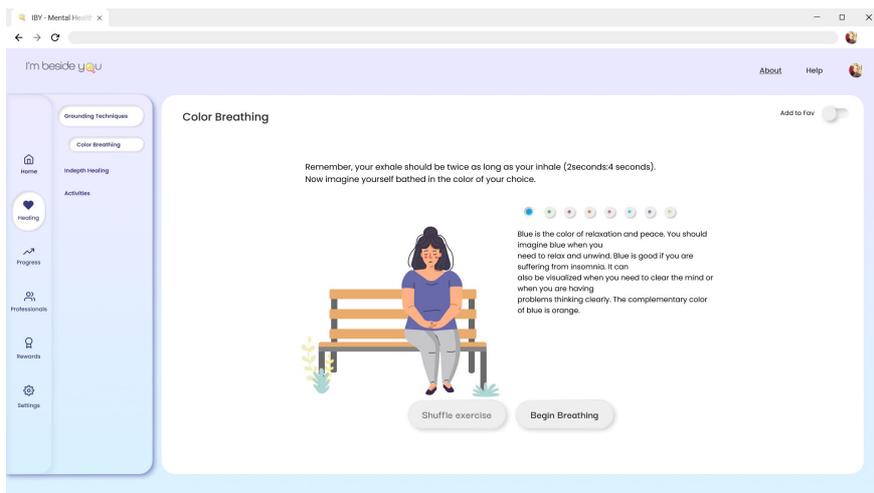
Figure 69: 4-7-8 Grounding Screen



**Figure 70: 5 Step Grounding Screen**



**Figure 71: Box Breathing Screen**



**Figure 72: Color Breathing Screen**

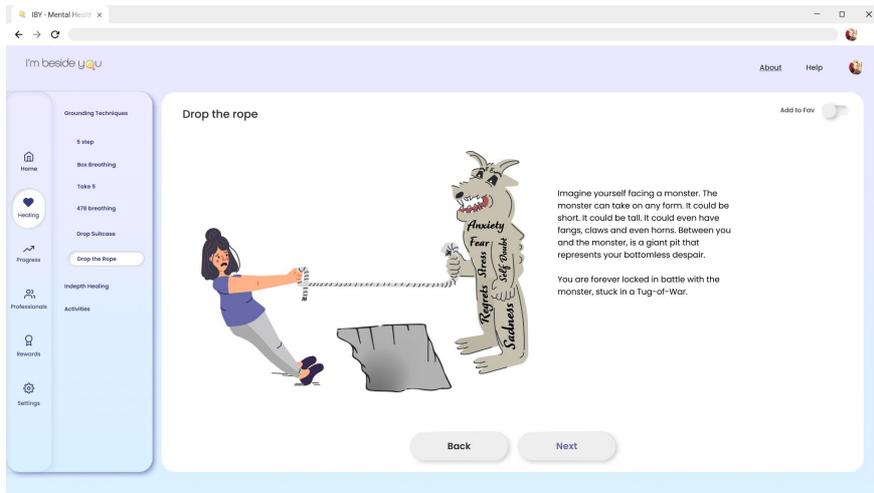


Figure 73: Drop the Rope Screen

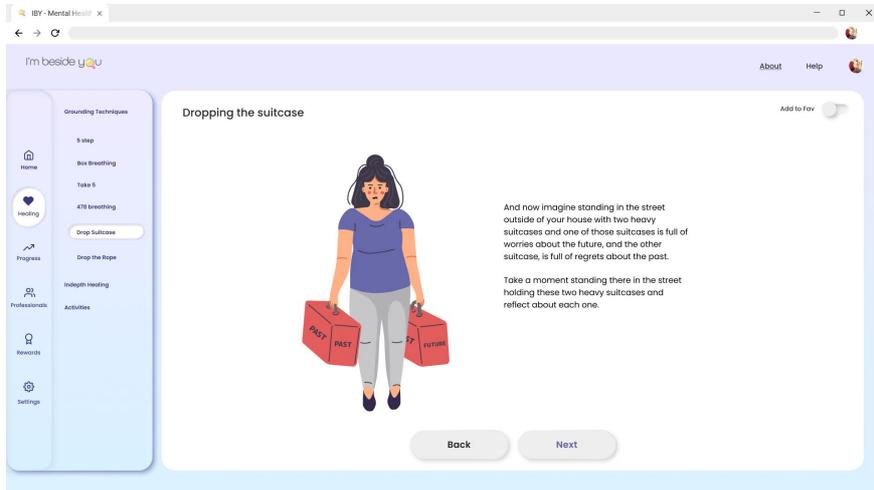


Figure 74: Drop Suitcase Screen

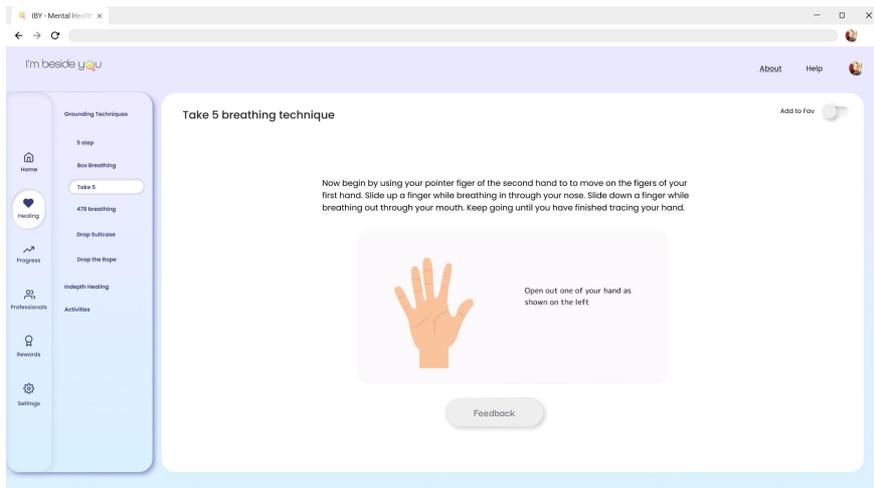
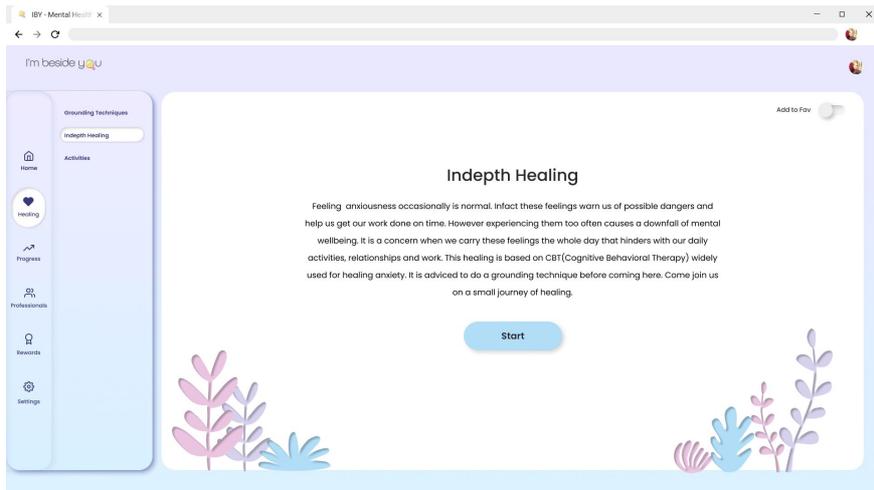
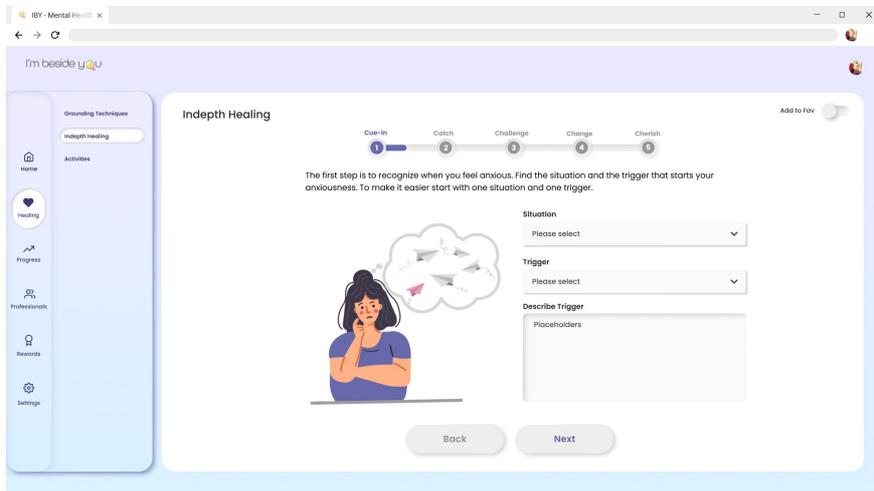


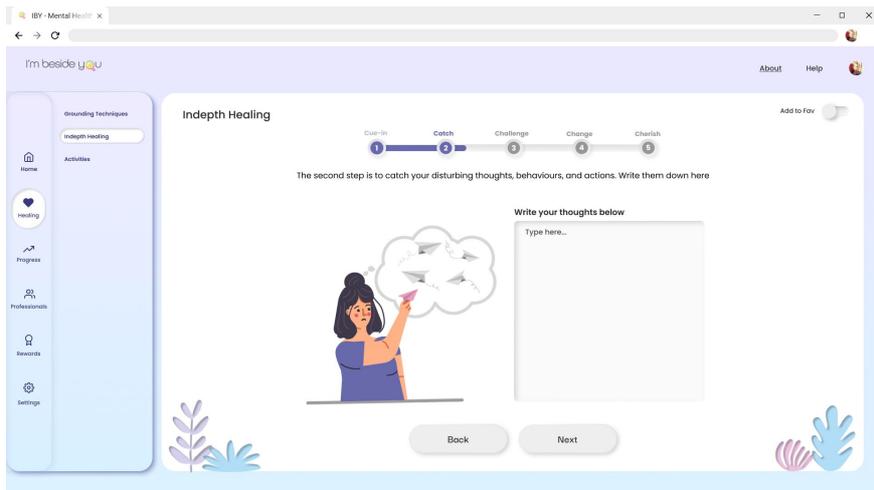
Figure 75: Take 5 Screen



**Figure 76: In-depth Healing Introduction Screen**



**Figure 77: In-depth Healing Screen 1**



**Figure 78: In-depth Healing Screen 2**

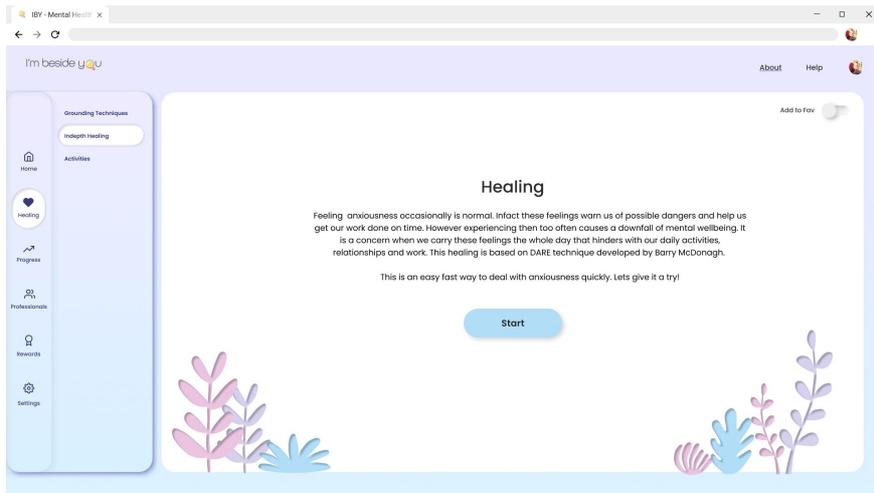


Figure 79: Healing(DARE Technique) Introduction Screen

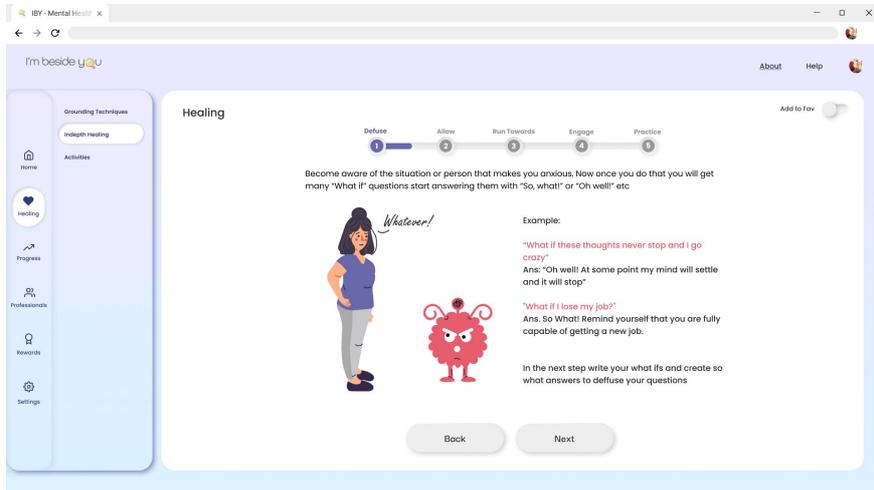


Figure 80: DARE Technique Screen 1

## **7. Conclusion**

### **7.1 My Journey**

The overall journey in this project has been with a lot of personal growth in terms of learning and empathizing with people suffering from any mental health issues. It has taught me how the words and behaviors must be very sensitive whilst interacting with any person suffering from anxiety. The illustrations and exercises have been created in such a way to make a person feel as comfortable as possible with the interface. I have been able to understand and learn neomorphism as well which was a new style of UI component design during the course of this project.

### **7.2 Conclusion**

To conclude, this project is an experiment in attempting to help users understand their anxiousness by an intelligent system. The intelligent system needs more testing that can verify with users if they actually felt as the results show. The healing aspect is based on many researched methods of Cognitive Behavioral Therapy and Grounding techniques that proven to be of help in the recovery of a large number of patients. Activities introduced have to be tested to see their effectiveness and appeal. Mobile version would be more suitable however due to the company's demands it has been shifted to the next phase. The next step would be to take it forward by testing this with users.

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