

Treadwill, a Website for Treating Depressive Symptoms

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I have lost all interest in life. I don't know what to do. Please help me!!

- An email to us at 3am.

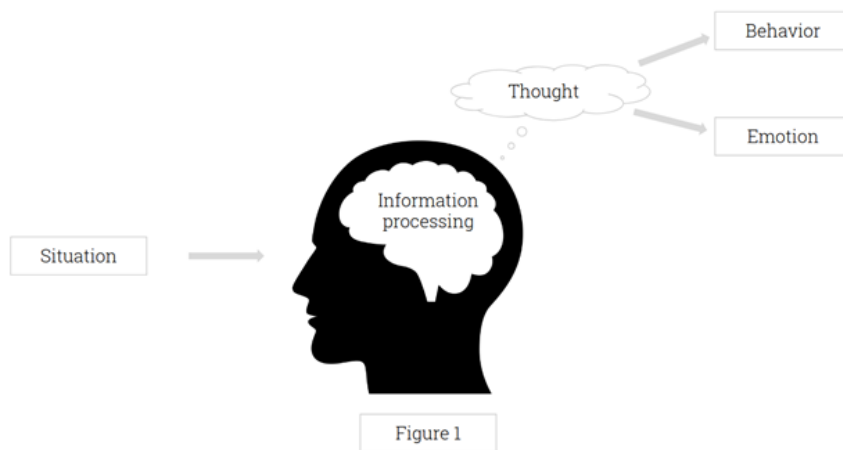
Swapnil is a 20-year-old engineering student. Over the past few weeks, he is noticing some changes in himself. He has lost interest in his studies. He doesn't enjoy talking to his friends anymore. He doesn't enjoy playing the guitar. He gets irritated at almost everything. He gets tired very quickly. Recently, he has also started to wonder about the meaning of his life. He has started to wonder whether it would make much difference to anyone if he weren't *around* anymore. He realizes that he has no conceivable reason to feel this way. He has a loving family and good friends. He has tried to snap out of this despondency. He has tried to shake it off. He has watched many motivational videos on YouTube. All these have had a transitory impact on him. He is not sure why this is happening to him all of a sudden, and he has no idea whom to turn to for help.

Swapnil is going through an episode of Major Depressive Disorder or more commonly known as depression. According to the World Health Organization, depression is currently the leading cause of disability worldwide affecting more than 300 million people. Swapnil is one of those 300 million individuals. Being from India, where mental health literacy is poor, he has no idea that what he is going through can be treated. If he knew that he had depression, he would have

* Mr. Arka Ghosh, Ph.D. Scholar from Indian Institute of Technology, Kanpur, is pursuing his research on "Developing an Automated Online Tool to Help People with Depressive Symptoms." His popular science story entitled "Treadwill, A Website for Treating Depressive Symptoms" has been selected for AWSAR Award.

to admit it to his friends and family. The social stigma attached to mental health disorders is one of the biggest deterrents to seeking help. If he gathered the moral strength to “come out” to his friends and family and live the rest of his life with the label of being “*mental*,” the next difficult step would be to find a good psychiatrist. Whether he will be able to find a good psychiatrist depends on where he lives. Once he finds the psychiatrist, he will have to figure out if he has the time, money, and motivation to visit the psychiatrist regularly. As reported by the 2015-16, National Mental Health Survey of India, all these factors lead to a treatment gap of 85.2% for depression in India. Which means that out of 100 depressed Indians, 85 of them don’t get adequate treatment.

This treatment gap can be bridged, at least partially, if there is a way to deliver online automated and free treatment. While the lack of awareness is a deep-rooted problem which will require a multi-faceted and long-term action plan, an automated online and free treatment can solve the problems of distance and cost and can circumvent social stigma. This approach of delivering automated online mental health intervention had started in 1966 in MIT with Prof. Joseph Weizenbaum. Only in the past decade, however, interest in this area has boomed, and this has been shown to be a promising approach to tackling depression as a public health burden. The latest research in the field recommends providing online treatment guided by a mental health professional. This approach, however, is not suitable in India where the mental health professional to patient ratio is abysmally low. So, under the guidance of Prof. Nitin Gupta at the Department of BSBE, IIT Kanpur, I started working on a fully automated online intervention, TreadWill (www.treadwill.org), to help people deal with depressive symptoms.



For there is nothing either good or bad but thinking makes it so. - Shakespeare

Figure 1 shows a simplified flow of information when a person faces any situation. For a depressed individual, the “information processing” after the situation is negatively biased, culminates in exaggerated negative thoughts. These exaggerated negative thoughts lead to negative emotions and dysfunctional behaviour which are the most visible symptoms of depression. From this it can be inferred that there are two points of intervention to help depressed individuals. One is to help them identify these negative thoughts and take a more realistic view of the situations; the other is to retrain the “information processing” to remove the negative bias.

Cognitive Behavioral Therapy (CBT) is a therapeutic technique based on the first approach developed by Dr. Aaron T. Beck in the 1960s. A CBT therapist teaches a depressed patient techniques to identify and evaluate their negative thoughts. Using the different techniques of CBT, the patient realizes that their negative thoughts are unrealistic and gradually learns to take a realistic view of the situations. The structured and time-limited nature of CBT makes it suitable for automated online delivery. So, we have developed TreadWill to teach the techniques of CBT to patients. TreadWill uses slides, videos, and interactive text material to teach the techniques of CBT engagingly. To provide a tailored intervention to patients, TreadWill provides content relatable to the patient's personal profile. To provide a sense of belongingness, TreadWill includes a Support Group where patients can post their problems and seek help from others. The first version of TreadWill is based solely on CBT. We are currently conducting a clinical trial to test the effectiveness of the first version of TreadWill.

Cognitive Bias Modification (CBM) is an umbrella term for cognitive training tasks that aim to retrain the “information processing” biases in individuals with different mental health disorders like depression, anxiety, and addictions. To get a better understanding of the term Cognitive Bias, read Box 1.

When you are in depression, your EATING habit changes.

SO_P

Box 1

If you read the sentence and then the word, then most probably the word that came to your mind when you read SO_P, is soup. On the other hand, had the sentence in the box been “When you are in depression, you don't take a bath regularly,” you would have read SO_P as soap. This is an example of priming. The preceding sentence primes you for a very short duration to read SO_P as soup or soap. When someone is going through an episode of depression, they are primed to interpret situations negatively. This is the “information processing” bias or Cognitive Bias. Specifically, depressed individuals have biases in attention, interpretation, and memory. They are more attentive towards negative information, they interpret situations in a negative way, and they recall negative memories when thinking about their past. These biases are modifiable using cognitive training tasks. Multiple research groups around the world have used different cognitive training tasks to modify these biases leading to reduced depressive symptoms. Patients, however, reported that they found the training tasks monotonous. So, it is unlikely that depressed patients, who already lack the motivation to do anything at all, will do these tasks diligently when left unsupervised. So, we are including games based on these tasks in TreadWill. If the patients find the games engaging, they will play it repeatedly making it easier to provide the adequate dosage required for cognitive training games to be effective. We also expect the games to increase the overall engagement with TreadWill. We are including these games in the second version of TreadWill.

The proof of the pudding is in the eating.

The first version of TreadWill is based fully on CBT. We are conducting a clinical trial to test the effectiveness of TreadWill. We will be dividing 600 patients into three roughly equal groups. Each patient will have an equal chance of being assigned to either of the three groups. The first group will receive access to full-featured TreadWill. The second group will receive access to a limited version of TreadWill which will have the same content in a text format, and the third group will be put on a waiting-list for six weeks after which they will be given access to the full-featured TreadWill. If the patients in the first group improve more than the ones in the second group, then we can infer that the interactive features (slides, videos, interactive text) are effective in making TreadWill more engaging and effective. If the patients in the first and second group improve more than the ones in the third group, then we can infer that TreadWill, either the full-featured or the limited version, is better than six weeks of time in reducing depressive symptoms. Currently (as of 29/9/2018), we have recruited more than 400 patients. Patients have reported that TreadWill has positively affected their lives, and they found the interactive features useful. We are simultaneously developing the second version of TreadWill in which we are including games based on CBM and improving existing features based on feedback from the first trial. We will conduct another trial in which we will be recruiting participants from different countries as well.

Image source: Brain HD PNG (<http://pluspng.com/brain-hd-png-5563.html>)