# Hey Yaar – A Counselor Chatbot

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***Abstract*-** The main objective of this study is to bridge the gap between mental health management systems and the users by machine learning via an interactive chatbot that performs clinical analysis and predicts the mental health problems by searching reliable databases and thereby handles the stress of people. A user-friendly Chatbot utilizing natural language processing technique will simulate the role of a psychologist, counselor, or stress specialist who provides virtual counseling. The successful implementation of this project is expected to provide people with access to free treatment to overcome their plights and predicaments, and reduce the time and human effort required to determine the best recommendations and solutions for stress management

***Index Terms***- Machine Learning, (NLP) Natural Language Processing, Psychiatry, Psychology, Virtual Counseling, Mental Health Management System

1. Introduction

Everybody has stress and/or mental health related issues. In fact, according to a 2015 study (globally) the number of people who suffered from some form of depressive disorder worldwide was estimated to be over 322.48 million people. And according to another 2017 study, more than 14 percent of the total populace in India suffers from variations of mental disorders; thereby, constituting a major cause of distress in people’s life with impact on the well-being of the society and the social quality thereof. Unchecked stress can also lead tonumber of health issues, effecting one physiologically and taking a toll on your body and one’s daily life. Indeed, roughly 50-80% of all physical illnesses are caused by stress where the effect thereof is believed to be the main cause of these dysfunctions and is correlated with increase in risk diabetes, cardiovascular (heart) diseases, sexual malfunction, et cetera, and other physical ailments such as migraines, skin disorders, epilepsy; whereof each of these illnesses – and many others – are psychosomatic in nature (prompted or exacerbated by mental conditions such as stress).  
  
In general, it can be said that stress has three effects (broadly):

• Subjective effects – this includes:   
1. Anxiety or frustration   
2. Panic attack   
3. Feeling tired, unwell, or lonely   
4. Depression   
5. Moodiness

• Observable behavioral changes – this includes:   
1. Increased accidents   
2. Compulsive internet surfing   
3. Drug or alcohol use  
4. Argumentative behavior   
5. Development of binge eating or other eating disorders  
  
• Physical/Psychosomatic symptoms – this includes:   
1. Stomach or digestive problems   
2. Sexual malfunction  
3. Weak immune system   
4. Tightness or clenching of jaw muscles.  
5. Chest tightness

To solve these problems efficiently and cheaply an application of artificial intelligence (AI) i.e., machine learning could be applied to predict outcomes and automatically learn and improve from experience (without being explicitly programmed). Machine learning is a means of data analysis tool that automates analytical model, that begins with observations or some data in order to look for patterns and use the examples you provide to make better decisions in the future. The main goal is to allow computers to automatically learn and adjust their behavior accordingly and provide appropriate solutions without human intervention or action. It can also be used for mental health management by using the application of natural language processing.

In recent years, natural language processing (NLP) – a subfield of artificial intelligence (AI) technology that has enabled users to analyze and understand text and speech from large scale textual data and derive meaning from it – has played an important role in aiding computational linguistics and facilitating various tasks from the application thereof such as information extraction, sentiment analysis, emotion recognition, and mental health monitoring.

Ascertaining mental illness from texts can be viewed as a text mining and natural language processing venture to predict and/or identify its indicators to generate suitable responses whereby to facilitate remedy and mental health management.

1. Need to work

Stress is known to have many physiological effects on our body leading to several problems. However, despite that, it is still infeasible for most people to visit a clinician as the cost of therapy is quite expensive. Therefore, we need digitized healthcare systems. Using natural language processing we can make inferences about people’s mental states through that which is expressed in written form, for people often describe their emotions and communicate with others by putting it in writing, expressing their emotions, feelings, mental states, and such. This can be used to identify how they are feeling and is a direct pathway to their mental condition wherewith we can make predictions about the user’s mental state and provide apt assistance. This saves the person the cost of clinician, by providing costless therapy; and by completing the treatment in less than a second, it saves the time it takes for the user to visit a therapist. Thereby, overcoming the gap created between these healthcare and users.

1. Literature survey

<https://www.researchgate.net/publication/336269909_Generating_and_Analyzing_Chatbot_Responses_using_Natural_Language_Processing>  
  
<https://ijresm.com/Vol.3_2020/Vol3_Iss2_February20/IJRESM_V3_I2_187.pdf>  
  
<https://pdfs.semanticscholar.org/0852/7a69fce2927af0044d35619da8b13232fbb7.pdf>

1. Literature survey

This section will examine the previous work of virtual Chatbots and the implementation thereof.   
  
A. Chatbots applications and utilities   
  
Chatbots are interactive software applications used to emulate conversations whereby to generate appropriate responses/answers to questions and automate conversations between the user and machine. It is a modern, intelligent conversational and dialogue system that has utilities in many disciplines; including but not limited to psychology, philosophy, marketing, customer service, sales, linguistics, and many more.  
  
B. Natural Language Processing   
  
NLP (Natural Language Processing) is an application of AI. That allows the users to discourse with machines by the processing of analyzing and understanding text by syntactic and semantic analysis. Semantic refers to the meaning of the words therein (and sentence). And syntactic refers to grammatically meaningful arrangement of words in a sentence. Semantic analysis refers to capturing the meaning behind sentences by scrutinizing the logical structure of sentences in order to derive similarities between words.  
  
The text also needs cleaning and modification before it can be used: such as removing fillers, punctuation marks, URLs, and the like thereof; for these texts do not contain any meaningful information rendering them redundant. Furthermore, the text also needs stemming by which to extract the root words such as “happiness” for “happy” and so on. It is very important to minimize words during the text preprocessing stage to group similar features in order to get better predictions