Project Report

on

Predicting Depression, Anxiety and Stress

Submitted as Mini Project Report

FOR MINI PROJECT LAB(KCS-554)

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in

Computer Science Department

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STUDENT'S DECLARATION

I / We hereby declare that the work being presented in this report entitled "**Predicting Depression, Anxiety and Stress**" is an authentic record of my / our own work carried out under the supervision of "Mr. Gopal Gupta".

The matter embodied in this report has not been submitted by me / us for the award of any other degree.

Dated: 21 December,2021

Signature of students

(Sanjana Jain)

(Computer Science)

This is to certify that the above statement made by the candidates is correct to the best of my knowledge.

Signature of HOD

(Mr. Pankaj Sharma)

(Computer Science)

Date.....

Signature of Supervisor

(Mr. Glopal Gupta)

ACKNOWLEDGEMENT

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We also do not like to miss the opportunity to acknowledge the contribution of all faculty members of the department for their kind assistance and cooperation during the development of our project. Last but not the least, we acknowledge our friends for their contribution in the completion of the project.

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Topic Name Predicting Depression, Anxiety and Stress

Project Description

Humans are, by nature, becoming ambitious nowadays and seek every possible opportunity to grow now believe them to be part and parcel of professional life. The World Health Organization (WHO) has observed that depression is the most prevalent mental disorder affecting more than 300 million people worldwide, and the severity of the issue has led many health researchers to focus their studies in this area. Differentiating anxiety, depression and stress from one another is problematic for machines; hence, an appropriate learning algorithm is required for an accurate diagnosis. According to WHO, a healthy person possesses a healthy brain along with physical wellness.

Depression and anxiety are leading causes of disability worldwide, with estimated lifetime prevalence rates of 20%. Whilst the majority of individuals with depression and anxiety are treated in primary care settings, over 50% of people are not recognized or adequately treated.

Given the adverse health outcomes and costs associated with untreated conditions and the recent increase in the prevalence of common mental disorders , adequate diagnosis and timely treatment of depression and anxiety has become an urgent priority.

Problem Introduction

The Taylor Manifest Anxiety Scale was first developed in 1953 to identify individuals who would be good subjects for studies of stress and other related psychological phenomenon. Since then it has been used as a measure of anxiety as general personality trait. Anxiety is a complex psychological construct that includes a multiple of different facets related to extensive worrying that may impair normal functioning. The test has been widely studied and used in research however there are some concerns that it does not measure a single trait but instead measures a basket of loosely related ones and so the score is not that meaningful.

Procedure:

The test consists of fifty statements about you. You must rate each one as true or false.

Method

This data was collected with an on-line version of the Depression Anxiety Stress Scales (DASS21).

The survey was open to anyone and people were motivated to take it to get personalized results. At the end of the test they also were given the option to complete a short research survey. This datatset comes from those who agreed to complete the research survey and answered yes to the question "Have you given accurate answers and may they be used for research?" at the end.

The following items were included in the survey:

Q1 I found myself getting upset by quite trivial things.
Q2 I was aware of dryness of my mouth.
Q3 I couldn't seem to experience any positive feeling at all.
Q4 I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion).
Q5 I just couldn't seem to get going.
Q6 I tended to over-react to situations.
Q7 I had a feeling of shakiness (eg, legs going to give way).

Q8 I found it difficult to relax.
Q9 I found myself in situations that made me so anxious I was most relieved when they ended.
Q10 I felt that I had nothing to look forward to.
Q11 I found myself getting upset rather easily.
Q12 I felt that I was using a lot of nervous energy.
Q13 I felt sad and depressed.
Q14 I found myself getting impatient when I was delayed in any way (eg, elevators, traffic lights, being kept waiting).
Q15 I had a feeling of faintness.
Q16 I felt that I had lost interest in just about everything.
Q17 I felt I wasn't worth much as a person.
Q18 I felt that I was rather touchy.
Q19 I perspired noticeably (eg, hands sweaty) in the absence of high temperatures or physical exertion.
Q20 I felt scared without any good reason.
Q21 I felt that life wasn't worthwhile.
Q22 I found it hard to wind down.
Q23 I had difficulty in swallowing.
Q24 I couldn't seem to get any enjoyment out of the things I did.
Q25 I was aware of the action of my heart in the absence of physical exertion (eg, sense of heart rate increase, heart missing a beat).
Q26 I felt down-hearted and blue.
Q27 I found that I was very irritable.
Q28 I felt I was close to panic.
Q29 I found it hard to calm down after something upset me.
Q30 I feared that I would be "thrown" by some trivial but unfamiliar task.
Q31 I was unable to become enthusiastic about anything.
Q32 I found it difficult to tolerate interruptions to what I was doing.
Q33 I was in a state of nervous tension.
Q34 I felt I was pretty worthless.
Q35 I was intolerant of anything that kept me from getting on with what I was doing.
Q36 I felt terrified.
Q37 I could see nothing in the future to be hopeful about.
Q38 I felt that life was meaningless.
Q39 I found myself getting agitated.
Q40 I was worried about situations in which I might panic and make a fool of myself.
Q41 I experienced trembling (eg, in the hands).
Q42 I found it difficult to work up the initiative to do things.

Each item was presented one at a time in a random order for each new participant along with a 4 point rating scale asking the user to indicate how often that had been true of them in the past week where

1 = Did not apply to me at all

2 = Applied to me to some degree, or some of the time
3 = Applied to me to a considerable degree, or a good part of the time
4 = Applied to me very much, or most of the time

This response is stored in variable A (e.g. Q1A). Also recorded was the time taken in milliseconds to answer that question (E) and that question's position in the survey (I).
These other durations were also recorded (measured on the server's side):

introelapse The time spent on the introduction/landing page (in seconds)
testelapse The time spent on all the DASS questions (should be equivalent to the time elapsed on all the individual questions combined)
surveyelapse The time spent answering the rest of the demographic and survey questions

In total, total 39800 instances were collected through online questionnaires between 2017-2021 by different methods. The dataset consists of 42 questions taken from the standard form of DASS21.

Motivation

The major problem that everyone is facing is the unawareness of being mentally unfit or treating it as taboo. It is important to identify it and then find its cause and treat it on an immediate basis. This is the key motivation for our project to make people aware of their mental well-being without any interference and make them understand the key difference between depression, anxiety, and stress.

The main symptoms of depression from a clinical point of view are loss of memory; lack of concentration; an inability to make decisions; loss of interest in recreational activities and hobbies including sex; overeating and weight gain; low appetite and weight loss; feelings of guilt, worthlessness, helplessness, restlessness and irritation; as well as suicidal thoughts. These symptoms were found to have a significant effect on important areas of an individual's life – such as in education, employment and social activities, and this provides a vital clue for forming a clinical diagnosis.

The symptoms of GAD (Generalised Anxiety Disorder) are irritability, nervousness, fatigue, insomnia, gastro intestinal problems, panic, and a sense of impending danger, increased heart rate, sweating, rapid breathing and difficulty concentrating.

The symptoms of stress are feeling upset or agitated, an inability to relax, low energy levels, chronic headaches, frequent overreaction and persistent colds or infections. Thus, stress, anxiety and depression have many common symptoms including insomnia, chest pain, fatigue, increased heart rate and inability to concentrate, all of which makes classification challenging for machines.

Project Objective

The basic objective is to help people diagnose their mental health problems so that effective remedy can be taken without much delay. The model functionality is to provide the information that has the potential to allow health care providers to make informed recommendations for further screening regardless of whether the patient discusses or even recognizes his or her symptoms. This is important because as previously mentioned, it can take on average 6 or 14 years from onset of illness until diagnosis for MDD and GAD respectively. Our model is used to tackle this issue by not relying on previous psychiatric diagnoses or expensive imagine techniques to capture the disease in an early stage.

This study is a step in the direction towards identifying potentially difficult to diagnose illnesses with readily available and easy to obtain information.

Here ,we have attempted to assess levels of anxiety, depression and stress by using computers without the help of any medical experts or face to face interaction. The data is collected by online questionnaires filled in by different users between 2017 and 2021.

Scope of the Project

In this model, machine learning algorithms can be applied to determine five different severity levels of anxiety, depression and stress. Five different classification techniques can be applied – Decision Tree (DT), Random Forest Tree (RFT), Naïve Bayes, Support Vector Machine (SVM) and K- Nearest Neighbour (KNN).

Different researchers have applied different machine leaning algorithms for the prediction of psychological disorders, and the performances of different algorithms have been found to vary, depending on the scenario; no fixed algorithm has been determined as most suitable in all cases. Thus, all the machine learning algorithms can be applied to identify the symptoms of anxiety, depression and stress.

CONCLUSION

DASS is a tool broadly used by psychiatrists to determine the severity of three emotional states: depression, anxiety, and stress. In this study, we employed a DASS version with 42 items, which uses a specific self-analysis questionnaire (SAQ) in which subjects are asked to self-report on 14 items associated with emotional states, as follows

Depression. Dysphoria, anhedonia, inertia, hopelessness, devaluation of life, lack of interest, self-deprecation;

Anxiety. Autonomic arousal, situational anxiety, skeletal muscle effects, subjective experience of anxious affect;

Stress. Difficulty relaxing, nervous arousal, easily agitated/upset.

For each of these items, the subjects answer particular questions by self-rating, using a score on a scale from 0 to 3. The sum of all scores obtained from each item determines the severity of the emotional state as follows: Normal (0–9 score for depression, 0–7 score for anxiety, 0–14 score for stress), Mild (10–13 score for depression, 8–9 score for anxiety, 15–18 score for stress), Moderate (14–20 score for depression, 10–14 score for anxiety, 19–25 score for stress), Severe (21–27 score for depression, 15–19 score for anxiety, 26–33 score for stress), and Extremely Severe (28+ score for depression, 20+ score for anxiety, 34+ score for stress).