



## **A Suggestive Method for the Detection of Anxiety Level with Cure**

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### **ABSTRACT**

*Everybody has the blues, feels anxious, loses interest in enjoyable activities, or gets stressed sometimes, but when it continues for an extended time or interferes with daily activities, it should be more serious. Stress is the body's response to any demand or pressure. These demands are called stressors. When stressors in one's life are constant, they can take a toll on your mental and physical health. However, if one cannot shake unwarranted worries, or if the sentiments are jarring to the purpose of avoiding everyday activities, you'll have a disturbance.*

*Anxiety may be a feeling of fear, dread, and uneasiness. It links to the anticipation of a future concern and is more associated with muscle tension and avoidance behavior. It would cause you to sweat, feel restless and tense, and have a rapid heartbeat. It causes an associated abnormal and overwhelming sense of Apprehension and fears typically marked by physical signs (such as tension, sweating, and exaggerated pulse rate), and doubt regarding the fact and nature of the threat. It even causes timorousness concerning one's capability to address hits.*

*Evidence from a variety of sources suggests that early experience with diminished control may foster a cognitive style characterized by an increased probability of interpreting or processing subsequent events as out of one's control, which may represent a psychological vulnerability for anxiety. To help people to cope with anxiety an App is being developed which helps to overcome anxiety and help the public to build up their confidence*

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**Keywords:** Apprehension, Anxiety, App, Stressors, Anxiety prediction, Stress level.

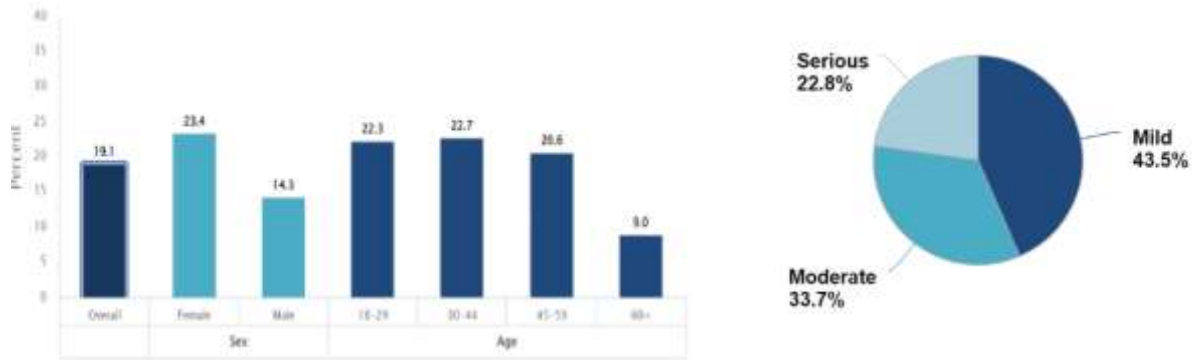
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### **1. Introduction**

In this quick world, individuals don't provide importance to their psychological state, and because of their negligence towards their psychological state, it's turning worse, moving not solely them but additionally their surroundings people. The world we are living in is moving so fast that people here neglect their fellow mates and the situation they are living in. In this era, people are suffering from many physiological problems or disorders that the person fails to recognize. As they fail to recognize the issue, it affects their mental health, which in turn affects their whole life.

One of the foremost common mental disorders that is the current world's major issue is anxiety. Anxiety is a normal stress reaction and can be beneficial in some situations. It can alert us to dangers and help us prepare and pay attention. Many folks area unit struck by it however sadly don't seem to be tuned in to it, which worsens their condition. they're going to have a way of concern, and worry but won't recognize the cause. As a result, it finally affects their daily life [2]. In real life, when a person faces a dangerous situation or a situation that generates fear in one's mind, the adrenaline rush of the person increases. The person's heartbeat increases and the person's whole mind becomes chaos. This situation is called panic. In general terms, panic attacks are sudden periods of intense fear, discomfort, or a sense of losing control even when there is no clear danger or trigger [17]. When people start to panic regularly, it ultimately results in panic disorder, which then leads to anxiety disorder considered. Anxiety could be a feeling of concern, worry, and uneasiness. It will cause physical feelings like nausea, upset stomach, dizziness, dry mouth, and tension. It causes an associated abnormal and overwhelming sense of Apprehension and fears typically marked by physical signs (such as tension, sweating, and exaggerated pulse rate), and doubt regarding the fact and nature of the threat. It even causes timorousness concerning one's capability to address it.[4]

According to the census taken for the percentage and intensity of anxiety, the results are[19]



**Fig. 1 - (a) census for anxiety; (b) intensity of anxiety.**

The effects of anxiety differ from person to person and the intensity depends on the coping level of the person, In casual discourse, the words anxiety, and fear are often used interchangeably. In clinical usage, they have distinct meanings: anxiety is defined as an unpleasant emotional state for which the cause is either not readily identified or perceived to be uncontrollable or unavoidable, whereas fear is an emotional and physiological response to a recognized external threat.

There are many forms of anxiety which are generalized anxiety disorder, illness anxiety disorder, specific phobia, social anxiety disorder, separation anxiety disorder, agoraphobia, panic disorder, and selective mutism.[16]

Generalized anxiety disorder involves persistent and excessive worry that interferes with daily activities. This ongoing worry and tension may be accompanied by physical symptoms, such as restlessness, feeling on edge or easily fatigued, difficulty concentrating, muscle tension, or problems sleeping.

A phobia is an intense fear of or aversion to specific objects or situations. Individuals with a phobia typically anticipate terrifying consequences from encountering the object of their fear. Specific phobias include all cases in which fear and anxiety are triggered by a specific stimulus or situation.

With panic disorder, a person has brief attacks of intense terror and Apprehension, often marked by trembling, shaking, confusion, dizziness, nausea, and/or difficulty breathing. These panic attacks, defined by the APA as fear or discomfort that abruptly arises and peaks in less than ten minutes, can last for several hours

Agoraphobia is the specific anxiety about being in a place or situation where escape is difficult or embarrassing or where help may be unavailable

Social anxiety disorder (SAD; also known as social phobia) describes an intense fear and avoidance of negative public scrutiny, public embarrassment, humiliation, or social interaction

Post-traumatic stress disorder (PTSD) was once an anxiety disorder (now moved to trauma- and stressor-related disorders in DSM-V) that results from a traumatic experience

Separation anxiety disorder (SepAD) is the feeling of excessive and inappropriate levels of anxiety over being separated from a person or place

OCD manifests in the form of obsessions (distressing, persistent, and intrusive thoughts or images) and compulsions (urges to repeatedly perform specific acts or rituals), that are not caused by drugs or physical disorder, and which cause anxiety or distress plus (more or less important) functional disabilities. It is not an anxiety disorder in the DSM-5 or the ICD-11. However, older versions: the DSM-IV and ICD-10, classified OCD as an anxiety disorder

Selective mutism (SM) is a disorder in which a person who is normally capable of speech does not speak in specific situations or to specific people[18]. In any given year the estimated percent of adults with various anxiety disorders are-Specific Phobia: 8% - 12%, Social Anxiety Disorder: 7%, Panic Disorder: 2% - 3%, Agoraphobia: 1-2.9% in Adolescents and Adults, Generalized Anxiety Disorder: 2%, Separation Anxiety Disorder: 0.9% -1.9%.[19]

The diagnosis of anxiety disorders is made by symptoms, triggers, and a person's personal and family histories. There are no objective biomarkers or laboratory tests that can diagnose anxiety. Regular therapies and sittings with the therapists help in the reduction of anxiety. Across the globe, there are many kinds of research conducted for the improvement of anxiety patients[20]. Many researchers have found treatments via online/offline mode which has helped in treating anxiety. When conducting online treatment, we do it either with the help of online meet or through Apps. In the market, we have many Apps which help to check the presence of anxiety and give a cure[3].

## 2. Problem Statement And Objectives

### A. Problem Statement

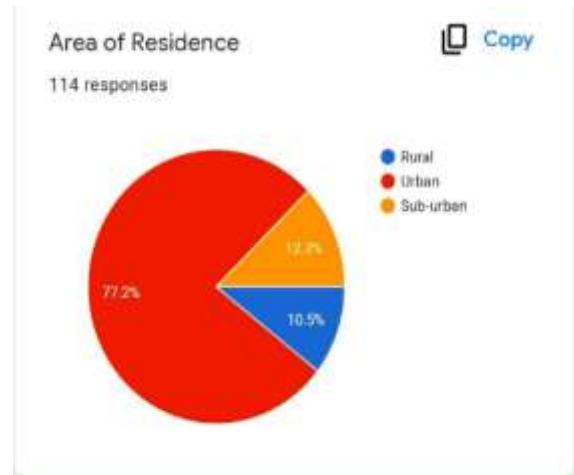
Anxiety is a feeling of fear, worry, and uneasiness. It affects one's mental health a lot due to which he is unable to live his life properly.

### B. Objectives

- To check and test anxiety in people
- To give suggestions to people to reduce their level of anxiety
- To help people to maintain good mental health and lead happy and peaceful life

#### C. Goal

- The following are some needs that may stimulate thinking about the benefits of a project idea.
- To detect the level of anxiety of the user through the App.
- To provide a simpler or better service to the public.
- To improve an existing product, service, or process.
- To modernize the working environment.



### 3. Identification of Community Partners And Stakeholders

#### A. Stakeholders' personal

- Stakeholders include system users, web developers, and legal representatives.
- System users are the people who sign up for Applications.
- Web developers are the project team members.
- Legal representatives are the people who ensure the site is operating within the law, they set the terms and conditions, and privacy policy of the website.

#### B. Description of the user

- Adults between the age of 18 and 27 are the main users of our project.
- Professional psychiatrists are consulted for suggestions and improvements for people who suffer from different levels of anxiety.
- People involved in the maintenance of the project are the team members themselves.

A survey was conducted for getting the opinions of the people regarding anxiety and how one copes with it. The result is in the form of a sheet. The link is <https://docs.google.com/spreadsheets/d/1O4a5XumP7shM4dROzrU6DK-GW6j1JUywl3wDZoHuqc/edit?usp=drivesdk>

The survey collected regarding our web page implementation from the people

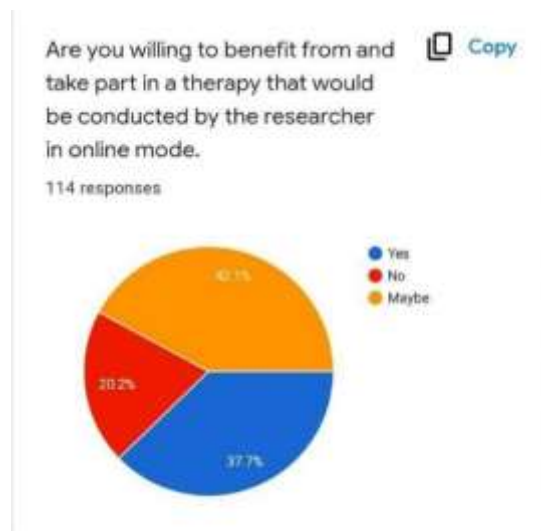


Fig. 2 Pie chart representing the response of the user regarding the use of the App

The methodology to solve the problem includes using a SWOT analysis of our team members and using brainstorming to solve the problem. The swot analysis of our team members is

#### A.Strength

- Able to detect the anxiety level of the users
- Customer-centric mindset
- Confidentiality is well-maintained
- 24/7 customer support available

#### B.Weakness

- Can give relaxation for a temporary period
- Have solutions for starting level of anxiety

#### C.Opportunities

- Advances in technology.
- Attracts a lot of people, especially young age
- New way of Approach for treating anxiety
- Suggests a psychologist if the user has a severe anxiety problem
- Emerging App which is quite needed for the society

#### D.Threat

- A new App with the same features can Appear in the future
- Cannot monitor the user throughout the day

The brainstorming steps include a discussion with the team members to solve the problem. The brainstorming session resulted in the algorithm to solve the problem in a way the password is strong and the username is unique.

Fig. 3 response of area of residence

### 3.1 Requirement Analysis

#### A. Key Stakeholders and end users

The stakeholders and end users include everyone who would like to sign up for an Application without any complications in the App.

#### B. Need of Stakeholders

- Functional needs:

The functional need of the App is the detection of anxiety levels based on the responses of the user.

- Performance:

The level should be detected correctly.

- Economical:

The stakeholder's or the user's information is managed with utmost care to avoid loss in any form such as privacy or revenue loss.

#### C. Requirements of Stakeholders

- User-friendly and secure App.
- Frontend: HTML, CSS, JAVASCRIPT
- Backend: PHP
- The requirements are captured by communicating with the stakeholder

#### 4. Materials And Methods

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#### 5. Implementation

With the help of the android studio, an App is created which will ask for the details of the user. After giving the details they will be directed to the question page which will contain a set of questions for testing the level of anxiety[6]. For each answer, the user is rewarded with points. When the user has answered all the questions, the points are calculated. According to Hamilton's scale, the level of anxiety is predicted. Based on the level suitable suggestions are given to the user to treat their anxiety.[12]

	Depression	Anxiety	Stress
Normal	0-9	0-7	0-14
Mild	10-13	8-9	15-18
Moderate	14-20	10-14	19-25
Severe	21-27	15-19	26-33
Extremely Severe	28+	20+	34+

Fig. 4 calculation table for anxiety

##### 5.1 PRELIMINARY DESIGN REVIEW AND PRELIMINARY PRODUCT DESIGN

The preliminary design for the product is to design an algorithm to solve the problem of passwords and usernames. The algorithm is as follows. The next step of the design is to design the App

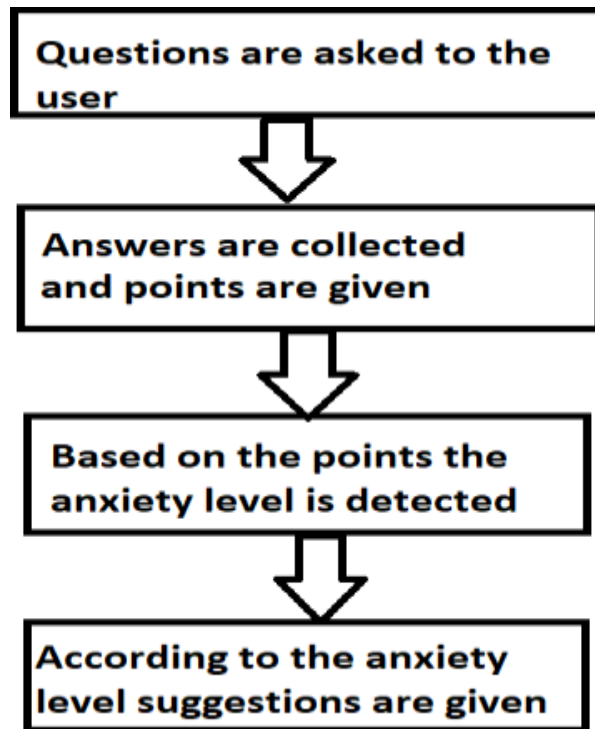


Fig. 5 algorithm for process

In the anxiety detection App, according to the answers to the questions, certain marks/ points will be awarded. These marks will be evaluated by an anxiety test scale. The Westside Test Anxiety Scale is a brief, ten-item instrument designed to identify students with anxiety impairments who could benefit from an anxiety-reduction intervention[8]. The most used scale for testing the anxiety is Hamilton scale. The Hamilton Depression Rating Scale (HAM-D or HDRS) is the most commonly used instrument for assessing symptoms of depression. It has been used in many key studies of depression and its treatment[3]. The scale items cover self-assessed anxiety impairment and cognitions that can impair performance.

There are many scales used for evaluating the scores

The HDRS (also known as the Ham-D) is the most widely used clinician-administered depression assessment scale. The original version contains 17 items (HDRS17) about symptoms of depression experienced over the past week. Although the scale was designed for completion after an unstructured clinical interview, there are now semi-structured interview guides available. The scoring method varies by version.[1] For the HDRS17, a score of 0–7 is generally accepted to be within the normal range (or in clinical remission), while a score of 20 or higher (indicating at least moderate severity) is usually required for entry into a clinical trial.

Versions -The scale has been translated into several languages including French, German, Italian, Thai, and Turkish. As well, there is an Interactive Voice Response version (IVR), a Seasonal Affective Disorder Version (SIGH-SAD), and a Structured Interview Version (HDS-SIV). Numerous versions with varying lengths include the HDRS17, HDRS21, HDRS29, HDRS8, HDRS6, HDRS24, and HDRS7[12]

With the help of the Hamilton scale, the anxiety level is correctly predicted. The meta-analysis was performed separately for internal consistency, inter-rater, and test-retest reliability. A pooled mean for the alpha coefficient in the random effects model was 0.789 (95%CI 0.766-0.810). The meta-regression analysis revealed that higher alpha coefficients were associated with higher variability of the HRSD total scores.[11]

About inter-rater reliability, pooled means in the random effects model were 0.937 (95%CI 0.914-0.954) for the intraclass correlation coefficient, 0.81 (95%CI 0.72-0.88) for the kappa coefficient, 0.94 (95%CI 0.90-0.97) for the Pearson correlation coefficient, and 0.91 (95%CI 0.78-0.96) for the Spearman rank correlation coefficient. A meta-regression analysis showed a positive association between inter-rater reliability and publication year. Test-retest reliability of HRSD ranged between 0.65 and 0.98 and generally decreased with extending the interval between two measurements (Spearman r between the duration of interval and test-retest reliability figures=-0.74) [12]

## 6. Business Aspects

The best to solve a problem is to make it a business model, which requires marketing. The business strategy for our App is that when more people use it, it can become a habit. So, the strategy is more or less like the JIO strategy. i.e most important improvement is to store the credentials of the users so that they do not fall into hands of the malicious attackers. To attract customers, we plan to have the App free for some time, till it becomes a habit for users as well as Application administrators.

6.1 Module Description

In our App, we will be asking questions to the user. Based on the answers, points will be given. We are using hamilton’s scale to get the user’s anxiety level. The range of the points will be stored in our database. The points which the user got will be compared with the range of points stored in the database. Based on the range the user will be intimated with their anxiety level and suggestions to cope with anxiety and lead a normal life

A. Users

Users include system users who need the App to check their anxiety levels. They also include other stakeholders who visit the site in their time of need.

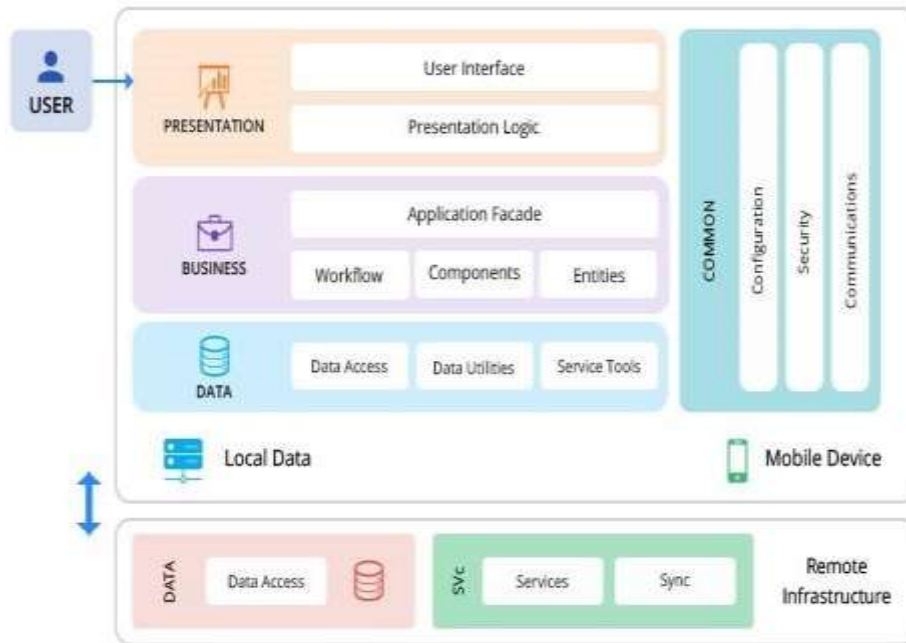


Fig. 6 working of the model

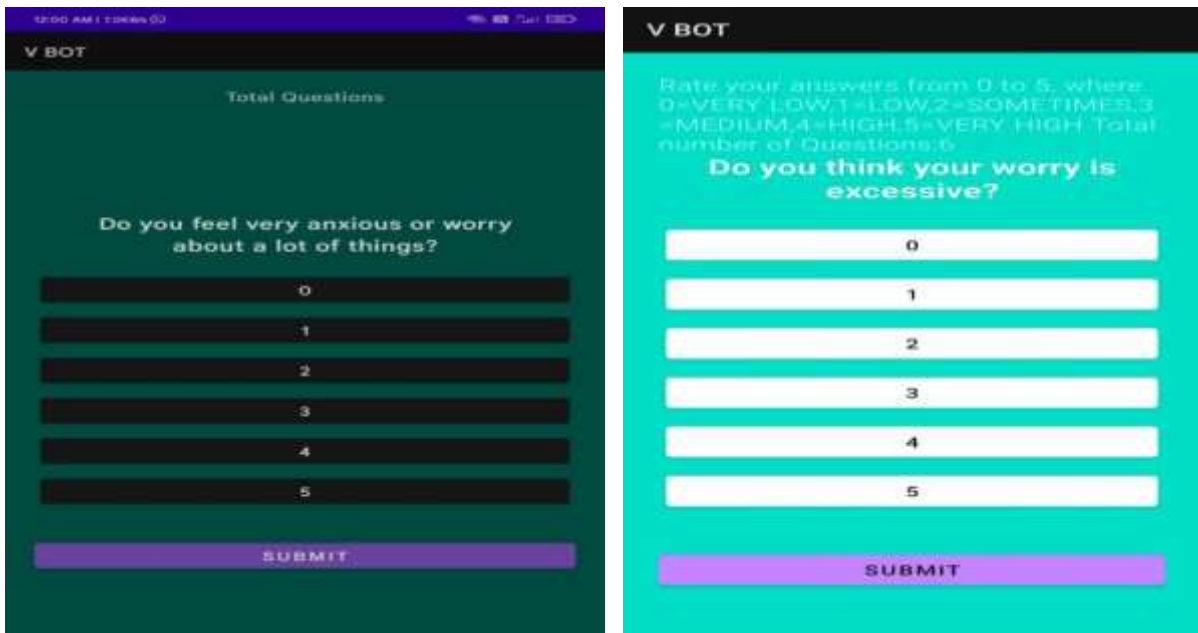


Fig. 7(a) question page;(b) question page

## 7. Results and Discussion

There are several methods online/offline to check for anxiety. Many people feel uncomfortable having offline sessions due to their insecurity. As a result, many people do not get proper treatment for their illness and their condition gets worse. The online treatment is like a boon to people who feel uncomfortable expressing their views in hands-on sessions. The online treatment is held using several video meets and tests. This method does not disclose the identity and Appearance of the user due to which people feel confident and do not hesitate to share their views and discomfort[7]. This mode of treatment is getting a lot of positive responses.

The platform for online treatment is video meets, Apps, and websites. From these options, the App is a highly preferred one.[13]. Researchers have created many Apps which help with anxiety testing. These Apps along with the testing questions contain interesting mind games which help in reducing anxiety.[2]

The App was created has helped people to test the anxiety level of many users and the suggestions given were also useful to the users. The other Apps which were presented in the market were helpful to reduce anxiety for a short amount of time. For a perfect cure for anxiety, one should follow certain meditation techniques and mental exercises that will reduce anxiety in the longer run. Along with these one should also consult a psychologist and have regular therapies. For a particular level of anxiety, we have a specific treatment that will not be effective for patients with other levels of anxiety.

The App created helps people to detect anxiety along with the level of anxiety. This feature is not present in the App available in the market. With the scores that the user gets after answering the questions, the Hamilton scale is used to detect the level of anxiety. Many tests were conducted to test the accuracy of the scale. The accuracy of the scale is high and thus helped in predicting the anxiety level correctly.

According to the user's feedback of the user's the suggestions given to the users is very much useful to users and were able to treat their anxiety

Technology is highly developing and along with it, the medical field is also advancing. Many types of research are being conducted to improve the treatment and make it more effective. The next process will be to advance the features of the App which will improve the version of the current one

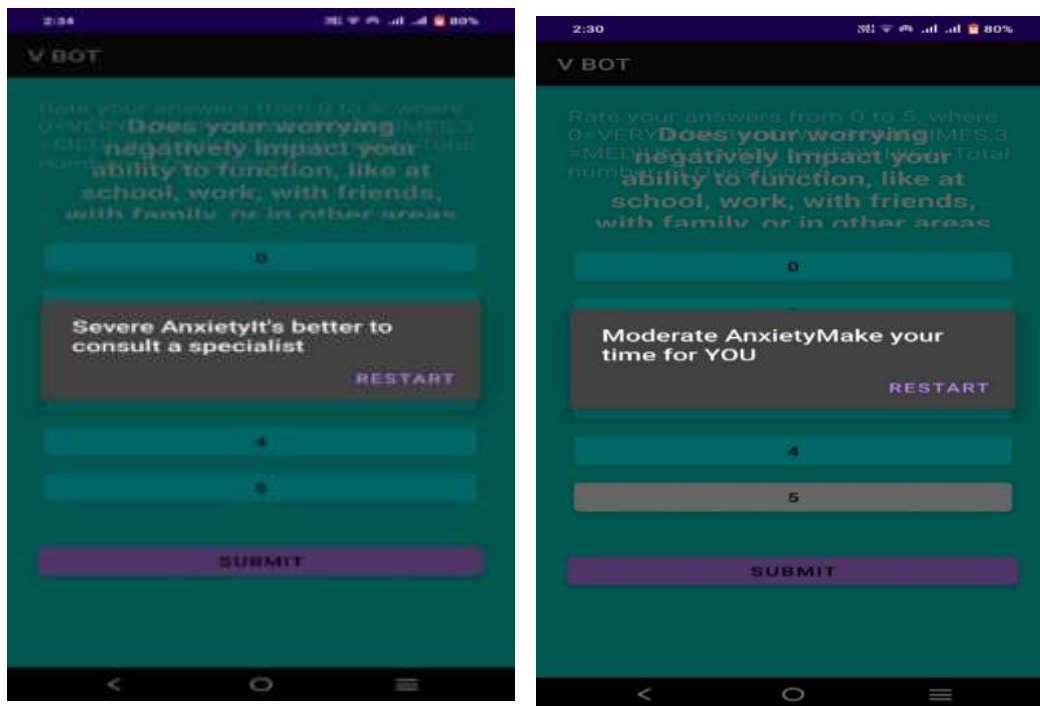


Fig. 8(a) output from the answers1;(b) output from the answers2

## 8. Conclusion

The future work is to implement the project for a larger range of age groups as currently, we are only focusing on teenagers and also to take steps that would help us to reach a large no. of people

## 9. Author's Note

I would like to declare that there is no conflict of interest regarding the publication of this article. This paper is free from plagiarism



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## 10. References

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- [1] Reliability of the Hamilton Rating Scale for Depression: a meta-analysis over a period of 49 years. Goran Trajković 1, Vladan Starčević, Milan Latas, Miomir Leštarević, Tanja Ille, Zoran Bukumirić, Jelena Marinković
- [2] The growth of research on anxiety disorders during the 1980 G. Ron Norton Ph.D. a b, Brian J. ox Ph.D. a b, Gordon J.G. Asmundson Ph.D. a b 1, Jack D. Maser Ph.D.
- [3] Anxiety and Depression Chatbot Features: A Scoping Review Nashva Ali, Arfan Ahmed
- [4] A Review of the Research on Accompanying Reasons for Academic Anxiety Insha Rasool, Syed Inshaallah Tahir, Shazia Jan Ph.D. Candidate, School of Education and Behavioural sciences
- [5] The relationships between sleep disturbances, resilience and anxiety among preschool children: A three-wave longitudinal study Xiuxiu Ding a, Shaodi Ma a, Haixia Liu a, Hao Wang a, Ning Li a, Qiuxia Song a, Wanying Su a, Mingming Liang a, Xianwei Guo a, Liang Sun b, Qirong Qin c, Mingchun Chen d, Yehuan Sun
- [6] Research Review: A meta-analysis of relapse rates in cognitive behavioral therapy for anxiety and related disorders in youth Hannah C. Levy, Kimberly T. Stevens, David F. Tolin
- [7] Face-to-face versus Video Teleconference Group Cognitive Behavioural Therapy for Anxiety and Related Disorders: A Preliminary Comparison Irena Milosevic, Ph.D., Duncan H. Cameron, Ph.D. and Karen Rowa, PhD
- [8] The effect of a smartphone-based perioperative nursing intervention: Prayer, education, exercise therapy, hypnosis, and music toward pain, anxiety, and early mobilization on cardiac surgery Sidik Awaludin, 1 Elly Nurachmah, 2 Tri Wisesa Soetisna, 3 Jahja Umar4
- [9] Anthes, E., Mental health: There's an App for that. *Nature*, 2016. · 532(7597): p. 20-3
- [10] Bendig, E., Erb, B., Schulze-Thuesing, L., & Baumeister, H. (2019), The next generation: chatbots in clinical psychology and psychotherapy to foster mental health—a scoping review *Verhaltenstherapie*,
- [11] Inter-rater reliability of the Hamilton Depression Rating Scale as a diagnostic and outcome measure of depression in primary care. Morriss R, Leese M, Chatwin J, Baldwin D; THREAD Study Group.
- [12] The comparison of Montgomery and Asberg Depression Rating Scale (MADRS thai) to the diagnostic and statistical manual of mental disorders (DSM) and Hamilton Rating Scale for Depression (HRSD): validity and reliability. Sathapisit S, Posayaanuwat N, Sasaluksananont C, Kaewpornasawan T, Singhakun S.
- [13] The Functionality of Mobile Apps for Anxiety: Systematic Search and Analysis of Engagement and Tailoring Features Lorraine Buis
- [14] Collins KA, Westra HA, Dozois DJ, Burns DD. Gaps in accessing treatment for anxiety and depression: challenges for the delivery of care. *Clin Psychol Rev.* 2004 Sep;24(5):583–616.
- [15] Stawarz K, Preist C, Tallon D, Wiles N, Coyle D. User experience of cognitive behavioral therapy Apps for depression: an analysis of App functionality and user reviews. *J Med Internet Res.* 2018 Jun 06;20(6):e10120.
- [16] The Diagnosis and Treatment of Anxiety Disorders Andreas Ströhle, Prof. Dr. med.,1,\* Jochen Gensichen, Prof. Dr. med. Dipl.-Päd. MPH,2 and Katharina Domschke, Prof. Dr. med
- [17] Autonomic Nervous Pattern of Motion Interference in Real-Time Anxiety Detection Hong Liu; Wanhui Wen; Jie Zhang; Guangyuan Liu; Zhaofang Yang
- [18] The Recognition of Multiple Anxiety Levels Based on Electroencephalograph Ziyu Li; Xia Wu; Xueyuan Xu; Hailing Wang; Zhenghao Guo; Zhichao Zhan
- [19] Exploring Individual Differences of Public Speaking Anxiety in Real-Life and Virtual Presentations Megha Yadav; Md Nazmus Sakib; Ehsanul Haque Nirjhar; Kexin Feng
- [20] Current Diagnosis and Treatment of Anxiety Disorders Alexander Bystritsky, MD, Ph.D., Sahib S. Khalsa, MD, Ph.D., Michael E. Cameron, Ph.D., and Jason Schiffman, MD, MA, MBA