

# Chapter 2

## Depression concepts

### 2.1 Meaning of depression

Depression is a common mental disorder, characterized by sadness, loss of interest or pleasure, feelings of guilt or low self-worth, disturbed sleep or appetite, low energy and poor concentration.

These problems can become chronic or recurrent, substantially impairing an individual's ability to cope with daily life. At its most severe, depression can lead to suicide. Most cases of depression can be treated with medication or psychotherapy.

### 2.2 Depression assessment

#### 2.2.1 Overview

A diagnostic assessment may be conducted by a licensed therapist, who will record the person's current circumstances, biographical history and current symptoms. The most important one is the mental state examination, which is an assessment of the person's current mood and thought content, in particular the presence of themes of hopelessness or pessimism, self-harm or suicide, and an absence of positive thoughts or plans.

The score on a rating scale alone is not sufficient to diagnose depression, but they provide an indication of the severity of symptoms for a time period. Several rating scales are used for this purpose. In the next section, the Hamilton Rate Scale for Depression (HRSD) is going to be presented and discussed.

## 2.2.2 The Hamilton Rate Scale for Depression

The Hamilton Rate Scale for Depression was created by Max Hamilton in 1960. It was devised for use only on patients already diagnosed as suffering from affective disorder of depressive type. It is used for quantifying the results of an interview. The interviewer should use all information available to help him with his interview and in making the final assessment.

The interview consists in a 17 question questionnaire, called the Hamilton test (see Appendix A). The topics discussed in this questionnaire are detailed below [18]:

- **Depressed mood:** The most useful indicator for depressed mood is the tendency to weep, but it must always be considered against the cultural background.
- **Suicide:** An attempt at suicide is given the highest score in this topic. There will be great difficulty sometimes in differentiating between a real attempt at suicide and a demonstrative attempt, which would be lower scored.
- **Work and loss of interest:** Difficulties at work and loss of interest in hobbies and social activities are both included in this topic. The patient who has given up work solely because of his illness is given the highest score.
- **Retardation:** This point is very difficult to rate. A completely mute patient would be given the highest score, but he/she would be therefore unsuitable for rating in the Hamilton scale. Less severe behaviors need much care and patience to rate, but it can be done.
- **Agitation:** This is defined as restlessness associated with anxiety.
- **Gastrointestinal symptoms:** These occur in connection with both anxiety and depression.
- **General somatic symptoms:** In depressions these are characteristically vague and ill defined, and it is extremely difficult to get a satisfactory description of them from the patient.
- **Hypochondriasis:** This is easy to rate when it is obviously present, but difficulties arise with mild hypochondriacal preoccupations.
- **Insight:** This must always be considered in relation to the patient's thinking and background of knowledge. It is important to distinguish between a patient

who has no insight and one who is reluctant to admit that he/she has a mental disease.

- **Loss of weight:** Ideally this would be measured in pounds or kilograms, but few patients know their normal weight and keep a check on it. It was therefore necessary to use a simple three-point scale.

During the interview, the therapist should rate each question. The sum of all the 17 scores constitute the so-called Hamilton score.

### 2.2.3 Depression severity

Once the Hamilton score for a given patient has been determined, it is time to decide which is the severity of his/her depression symptoms. The higher the Hamilton score is, the more depressed the given patient may be.

For psychologist, it is very difficult to define a fixed threshold for the Hamilton score, which enables to define is a person is very depressed, or if he/she no longer is.

The goal of this project is to build a classifier capable of separating the sessions in which a depressed patient appears, from the ones in which the person is healthy, this is, a two-classes classifier. This classifier has to be trained and eventually tested. For both tasks it is indispensable to have a ground truth, which consists in assigning a label to every video session, for instance, a 1 if it is a depressed session, and a -1 otherwise.

For assigning the labels to the sessions, i.e., creating the ground truth, a decision about the depression status of each session has to be made. For this, we define a certain criterion, which states the following:

- **Depressed sessions:** those with a Hamilton score higher or equal to 15.
- **Non depressed sessions:** those with a Hamilton score less or equal to 7.

In conclusion, this criterion of depression severity enables us to assign a class to each of the sessions: the depressed or the non depressed class.

