VOLUME-2, ISSUE-6

AN EXPERT SYSTEM FOR DEPRESSION DIAGNOSIS

Izzeddin A.

Department of Information Technology, Faculty of Engineering and Information Technology, Al-Azhar University, Gaza, Palestine

Abstract: Background: Depression (major depressive disorder) is a common and serious medical illness that negatively affects how you feel, the way you think and how you act. Fortunately, it is also treatable. Depression causes feelings of sadness and/or a loss of interest in activities once enjoyed. It can lead to a variety of emotional and physical problems and can decrease a person's ability to function at work and at home. Depression affects an estimated one in 15 adults (6.7%) in any given year. And one in six people (16.6%) will experience depression at some time in their life. Depression can strike at any time, but on average, first appears during the late teens to mid-20s. Women are more likely than men to experience depression. Some studies show that one-third of women will experience a major depressive episode in their lifetime. Objectives: The main goal of this expert system is to get the appropriate diagnosis of disease and the correct treatment and give the appropriate method of treatment through several tips that concern the disease and how to treat it and we will see it through the application on the expert system. Methods: in this paper the design of the proposed Expert System which was produced to help Psychologist in diagnosing depression disease through its symptoms such as: a loss of energy, a change in appetite, sleeping more or less, anxiety, reduced concentration, indecisiveness, restlessness, feelings of worthlessness, guilt or hopelessness and thoughts of self-harm or suicide. The proposed expert system presents an overview about depression disease is given, the cause of diseases is outlined and the treatment of disease whenever possible is given out. SL5 Object Expert System language was used for designing and implementing the proposed expert system. Results: The proposed depression disease diagnosis expert system was evaluated by psychologist students and they were satisfied with its performance. Conclusions: The Proposed expert system is very useful for psychologist, patients with depression and newly graduated psychologist.

Keywords: Artificial Intelligence, Expert Systems, SL5 Object, Depression, Language and psychologist.

1. INRODUCTION

While we all feel sad, moody or low from time to time, some people experience these feelings intensely, for long periods of time (weeks, months or even years) and sometimes without any apparent reason. Depression is more than just a low mood, it's a serious condition that affects your physical and mental health.

Figure 1: The figure presents the situation of depressed person

While we all feel sad, moody or low from time to time, some people experience these feelings intensely, for long periods of time (weeks, months or even years) and sometimes without any apparent reason. Depression is more than just a low mood, it's a serious condition that affects your physical and mental health.

Figure 1: The figure presents the situation of depressed person

Before adolescence, depression is rare and occurs at about the same rate in girls and boys. However, with the onset of puberty, a girl's risk of developing depression increases dramatically to twice that of boys.

Depression can run in families. When it does, it generally starts between ages 15 and 30. A family link to depression is much more common in women. However, there is not always an apparent genetic or hereditary link to explain why someone may develop clinical depression.

Diagnosis of depression is a very complex because it has many symptoms and may affect on human health. So, they need Psychologist with wide experience of depression.

For all the aforementioned reasons, we have developed this expert system to help psychologist in diagnosing the depression, in order to prescribe the appropriate treatment.

Expert System is a computer application of Artificial Intelligence (AI) which contains a knowledge base and an inference engine the main components and details are represented in figure 2.

Figure 2: The figure presents the Main Components of an Expert System

The proposed Expert System for Depression Diagnosis was implemented using, SL5 Object language which stands for Simpler Level 5 Object. It is a forward chinning reasoning expert system that can make inferences about facts of the world using rules, objects and take appropriate actions as a result. The SL5 Object engine is implemented in Delphi Embarcadero RAD Studio XE6. SL5 Object executes any Expert System looks like frames. It's easy for the knowledge engineer to build the Expert System and for the end users when they use the system.

2. LITERATURE REVIEW

Here is a summary of expert systems found in the literature:

An expert system for nausea and vomiting problems in infants and children[54] to aid users in getting the right diagnosis of problems of nausea and vomiting in infants and children (Gastro-esophageal reflux, Gastroenteritis, Systemic Infection, Bowel obstruction, Tumors, A bleeding disease, tonsillitis, and Hepatitis pharynx). Additionally, this expert system offers information about the disease and how to deal with it.

.	An expert system for feeding problems in infants and children [36] to diagnose feeding problems in infants and children.

.	Detecting Health Problems Related to Addiction of Video Game Playing Using an Expert System [39] to assist users in getting the correct diagnosis of the health problem of video game addictions that range from (Musculoskeletal issues, Vision problems and Obesity). Furthermore, this expert system delivers information about the problem and tells us how we can solve it.

.	An Expert System for Endocrine Diagnosis and treatments using JESS [66] was developed to help in diagnosing endocrine glands diseases.

## 3.	MATERIALS AND METHODS

The proposed expert system performs diagnosis for depression of all stages of the human life starting with simple symptoms by asking yes or no questions. The proposed expert system will ask the user to choose the correct answer in each screen. At the end of the dialogue session, the proposed expert system provides the diagnosis and recommendation of the disease to the user. Figure 3 shows a sample dialogue between the expert system and the user. Figure 4 shows how the users get the diagnosis and recommendation.
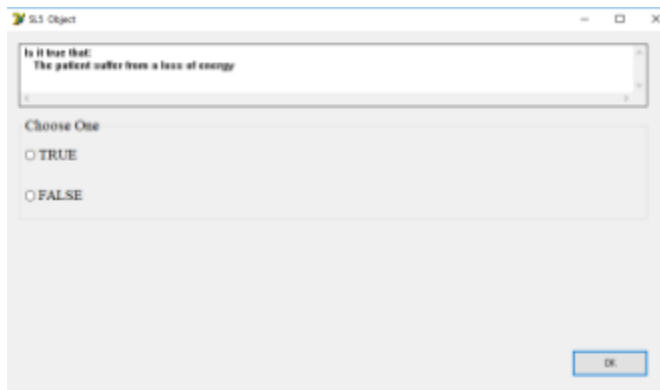
Figure 3: The figure presents shows when the system asks the user

Figure 4: The figure shows diagnosis and recommendation of the expert system

The main sources of the knowledge for this expert system are Psychologist and specializes websites for depression. The captured knowledge has been converted into SL5 Object Knowledge base syntax (Facts, Rules and Object). Currently the expert system has 9 rules which cover depression disease.

6. LIMITATIONS

The current proposed expert system is specialized in the diagnosis only depression with the following symptoms: a loss of energy, a change in appetite, sleeping more or less, anxiety, reduced concentration, indecisiveness, restlessness, feelings of worthlessness, guilt or hopelessness and thoughts of self-harm or suicide.

7. SYSTEM EVALUATION

As a preliminary evolution, Dr. Abdelazeez Noman and other Psychologist students tested this proposed Expert System and they were satisfied with its performance, efficiency, user interface and ease of use.

8. CONCLUSION

In this paper, a proposed expert system was presented for helping Psychologist in diagnosing patients with nine different symptoms possible depression. Psychologist and depression patients can get the diagnosis faster and more accurate than the traditional diagnosis. This expert system does not need intensive training to be used; it is easy to use and has user friendly interface. It was developed using SL5 Object Expert System language.

REFERENCES

1. https://www.psychiatry.org/patients- families/depression/what-is-depression
2. https://www.beyondblue.org.au/the-facts/depression
3. https://www.webmd.com/depression/guide/depression- women#1
4. Abu-Naser, S. S., Kashkash, K. A., & Fayyad, M. (2010). Developing an expert system for plant disease diagnosis. Journal of Artificial Intelligence ; Scialert, 3(4), 269-276.
5. Barhoom, A. M., & Abu-Naser, S. S. (2018). Black Pepper Expert System. International Journal of Academic Information Systems Research (IJAISR), 2(8), 9- 16.
6. Almadhoun, H. R., & Abu Naser, S. S. (2018). Banana Knowledge Based System Diagnosis and Treatment. International Journal of Academic Pedagogical Research (IJAPR), 2(7), 1-11.

7. Akkila, A. N., & Abu Naser, S. S. (2016). Proposed Expert System for Calculating Inheritance in Islam. World Wide Journal of Multidisciplinary Research and Development, 2(9), 38-48.

8. AbuEl-Reesh, J. Y., & Abu Naser, S. S. (2017). A Knowledge Based System for Diagnosing Shortness of Breath in Infants and Children. International Journal of Engineering and Information Systems (IJEAIS), 1(4), 102- 115.

9. Alajrami, M. A., & Abu-Naser, S. S. (2018). Onion Rule Based System for Disorders Diagnosis and Treatment. International Journal of Academic Pedagogical Research (IJAPR), 2(8), 1-9.

10. Abu Naser, S. S., Alamawi, W. W., & Alfarra, M. F.

(2016). Rule Based System for Diagnosing Wireless Connection Problems Using SL5 Object. International Journal of Information Technology and Electrical Engineering, 5(6), 26-33.

11. Almurshidi, S. H., & Abu-Naser, S. S. (2018). EXPERT SYSTEM FOR DIAGNOSING BREAST CANCER.

Al-Azhar University, Gaza, Palestine.

12. Azaab, S., Abu Naser, S., & Sulisel, O. (2000). A proposed expert system for selecting exploratory factor analysis procedures. Journal of the College of Education, 4(2), 9-26.