AN APPROACH FOR POSTPARTUM DEPRESSION AND MENTAL HEALTH IN WOMEN USING PREDICTION ALGORITHM OF DATA MINING

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Abstract

Postpartum Depression (PPD) or Melancholy is a situation that can arise in women after giving birth to a child. It is a dilemma of physical, emotional and behavioral changes that occur in some women after giving birth to a baby. A rapid change of hormones will take place in women after delivery. Recent studies show that 1 out of every 10 women will develop the longer-lasting depression after delivery. Hormonal imbalance brings so many chemical changes in women after delivery. Apart from these chemical changes, the social and mental changes after delivery may create an increased risk of depression.

If PPD is not discovered at the earlier stages, it may lead to serious issues for new mothers and their children. Recent research has identified several treatments for PPD, the reasons for PPD remains uncertain. The aim of this paper is to suggest a predictive model for the early identification and prediction of PPD from a set of propitious physical and emotional parameters which act as early markers for this syndrome. Data mining tools along with mathematical technique can be used for an effective data prediction.

Keywords: PPD, Data mining, Prediction algorithm

I INTRODUCTION

Postpartum depression or Melancholy is a condition which happens in women immediately after childbirth. Usually women have these types of condition for two three weeks immediately after the delivery, but sometimes it may continue to be more than 1 month. If women experience these mood swings for more than one month, the situation may not be favourable. Nowadays most of the women are experiencing these types of Melancholy and in severe cases it may last for 12 months after delivery. Women have the feeling of fear and anxiety during this period. Postpartum depression is also known as postnatal depression. If preventive measures are not taken at right time, it may lead to greater risk in life. Symptoms are included such as, lack of sleep, loss of body weight, fear, anger, difficulty in bonding with the baby.

II LITERATURE SURVEY

In [1], Weina Zhang proposed that SVM algorithm can be used for predicting PPD or Melancholy. In the prevention of PPD, more cares should be paid to the mothers. Developing a predictive model for PPD using the collected data during pregnancy period helps to determine the earlier identification and intervention.

In [2], Dayeon Shin proposed a model that uses a predictive model that achieved the highest performance in predicting postpartum depression. The model uses different features like various stress-related factors, family issues etc. This model can be used as a predictive model for PPD.

In [3], Priyanka Mazumder proposed a model that can help to predict the PPD among women. These predictive models are developed using Data Mining Algorithms such as Random Tree, Random Forest and Reduce Error Pruning tree.

In [4], Sriraam Natarajan proposed a model that uses machine learning techniques which determines the effectiveness of PPD. The model uses demographic,

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behavioral, and socioeconomic information for the prediction of PPD. This modeling can be used as an interesting future challenge.

In [5], S. Tortajada proposed models which use a multilayer perception. These models can predict the occurrence of PPD or Melancholy during the first 32 weeks immediately after delivery. This model can be used to determine the impact of each input variable in PPD.

In [6] L.E. Dennis proposed a multifaceted model for the prediction of PPD through various screening procedures. The findings suggested that several factors in the immediate postpartum period are consistent with previously identified factors such as mood swing, feeling unhappy for hospital discharge, hesitations for infant feeding method.

In [7], Joseph Levy proposed Machine learning-based models that can be used to identify the high-risk population at greatest need for preventive intervention, before development of PPD.

In [8], Nierman proposed an outcome prediction mathematical model that provides a context when discussing goals and expectations with patients and families.

In [9], Deepti R. Bathula proposed a model that uses machine learning (ML) methods which can evaluate by quantifying the performance metrics across all models in order to find the best predictive model.

In [10], Kiran Saqib proposed an ML algorithm which collects larger data sets and performs more advanced computations, and can improve the detection of PPD at an early stage.

In [11], Moshki proposed a Precede model for the prediction of mental health and postpartum depression in women.

In [12] , Li Lin proposed an RNN predictive model to encrypt multiple values of the event for predicting next event and its attributes.

In [13], Wil M.P.van der Aalst proposed a framework for checking congruency, predict the future and recommend appropriate actions using Data Mining.

In [14], Guy Amit proposed a method to extract socio-demographic and medical variables and build a machine learning model that predicts the risk of Postpartum Depression.

In [15], O'Hara, Michael W. proposed a behavioral model for the earlier detection of Postpartum Depression.
In [16], Jyotishman Pathak proposed a model which uses Electronic Health Records and Machine Learning to predict Postpartum Depression.

In [17], Joerg Evermann proposed a predictive model for process outcomes and for the next process event based on run time information.

III AN APPROACH FOR POSTPARTUM DEPRESSION AND MENTAL HEALTH IN WOMEN USING PREDICTION ALGORITHM OF DATA MINING

PPD is a physical and psychological disorder which occurs in women immediately after their delivery. It affects the mother child relationship. Recent studies reveal so many PPD cases in women and most of them are not disclosing this disorder to the family members.

Lack of support from society can cause PPD.The sign and symptoms include:

- Depressions
- Excessive crying
- Difficulty in affection with your baby
- Fatigue
- Keeping distance from family and friends
- Fear
- Anger
- Unable to sleep
- Not interested in any activities

Causes for PPD include:

- Hormone change
- Sleeplessness
- High stress environment
- Multi tasking
- Pre existing mental health struggles
- Lack of support from Family members or partner.

Data Mining is an important area in the field of Bioinformatics as it integrates statistical science, machine learning and database systems into one by applying the entire procedure of analysis and prediction of vast databases. In short, Data Mining is a collaborative field of Computer Science which helps to collect relevant data from large amount of unrelated raw data. By using several Data mining techniques such as classification, clustering and association, the data can be grouped into different categories according to the purpose.

The data collected is traversed through various data pre-processing techniques to achieve optimum authenticity or clarity. This algorithm gives the prediction analysis as the output.

There are two important processes in building a predictive model.

✓ Choosing the right criteria to solve the problem

✓ Selecting the appropriate prediction method from the various Data mining techniques.

Classification and Prediction model is used to extract a model. It is an important function in Data mining that assigns items according to their target classes. Classification methods make use of mathematical techniques such as decision trees, linear programming etc.

IV CONCLUSION

The suggested model can act as a decision support system to treat the victims diagnosed with PPD and eventually help them in maintaining a normal lifestyle. By passing through various stage in the workflow along with the application of appropriate tasks and techniques in data mining, optimum accuracy can be achieved.

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