

# Predicting Mothers with Postpartum Depression using Machine Learning Approaches

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**Abstract** - Postpartum depression (PPD) occurs in some mothers after giving childbirth because of changes in their physical, behavioral, and emotional. This mental disorder is hard to predict and its symptoms are complex. The main objective of this research is to develop a model to predict postpartum depression risk levels using mother's family, social background, and other data-related status of the mother. Also, using Edinburgh Postpartum Depression Scale (EPDS) has classified risk levels into 4 classes mild, moderate, severe, and profound, and trained and evaluated the proposed system on a Sri Lankan mothers' dataset based on their postnatal period within 6 months of childbirth. To build the proposed system this study has used Feed-Forward Neural Network (FFANN), Adaptive Neuro-Fuzzy Inference System with Genetic Algorithm (ANFIS - GA), Random Forest (RF), and Support Vector Machine (SVM). Because after reviewing past literature can find many models have gotten the best performance through these models. Finally, depending on the model's performance has supposed to identify which model has good performance when predicting. After model training and testing, the FFANN model (95% accuracy) and the ANFIS - GA model (testing error: 0.0600) have good performance as classification and regression types of models, respectively. Then comparing both models' performance, concluded that FFANN with multi-classification has the best performance when predicting postpartum depression risk levels. Further, it helps to identify more influential factors as well.

**Keywords** - Adaptive Neuro Fuzzy Inference System, Feed Forward Artificial Neural Network, Machine Learning, postpartum depression