**LITERATURE REVIEW**

Various studies have highlighted the significant health risks associated with GDM, including increased maternal risk of developing type 2 diabetes later in life and adverse outcomes for the baby such as macrosomia, preterm birth, and neonatal hypoglycemia (Feig et al., 2018; HAPO Study Cooperative Research Group et al., 2008).

Early detection of GDM is crucial for effective management and prevention of adverse outcomes, as it allows for timely intervention and personalized care (Weissgerber et al., 2016).

Recent research has explored the application of machine learning techniques, including Support Vector Machine (SVM) algorithms, in predicting GDM risk based on various clinical parameters.

For instance, a study by Al Rifai et al. (2020) demonstrated the efficacy of SVM models in predicting GDM risk using demographic and clinical data, achieving high accuracy and predictive performance.

Studies have utilized diverse datasets, including electronic health records and clinical databases, to develop predictive models for GDM detection (Kuo et al., 2017; Olmedo-Torre et al., 2020).

Preprocessing steps such as data cleaning, imputation of missing values, and normalization of features are commonly employed to ensure the quality and reliability of the dataset (Nasab et al., 2019).

Researchers have employed various machine learning algorithms, including SVM, logistic regression, and decision trees, for GDM prediction, with SVM often demonstrating competitive performance (Zhang et al., 2019; Kavakiotis et al., 2017).

Evaluation metrics such as accuracy, sensitivity, specificity, and area under the receiver operating characteristic curve (AUC-ROC) are commonly used to assess the performance of GDM prediction models (Jiang et al., 2020).

Studies have investigated the impact of parameter optimization and feature selection techniques on the performance of SVM models for GDM prediction (Song et al., 2021; Feng et al., 2018).

Techniques such as grid search, cross-validation, and recursive feature elimination have been employed to optimize SVM parameters and enhance predictive accuracy.

Real-world applications of machine learning-based GDM prediction models have been demonstrated in clinical settings, facilitating early identification of at-risk individuals and personalized intervention strategies (Song et al., 2020; Wang et al., 2019).

Case studies and clinical trials have shown promising results in improving maternal and neonatal outcomes through early detection and management of GDM using machine learning algorithms.

Ongoing research endeavors aim to further refine and validate machine learning-based approaches for GDM detection, with a focus on enhancing predictive accuracy, scalability, and clinical utility (Cho et al., 2021; Li et al., 2020).

The integration of advanced analytics techniques, including deep learning and ensemble methods, holds promise for advancing the field of GDM prediction and improving healthcare outcomes for pregnant women and their babies.