**Literature Review**

Obesity is a global health issue with various diseases such as diabetes, cardiovascular issues, and so on. Machine learning techniques have been increasingly used to classify obesity risk by analyzing complex data patterns**.** For instance, Zarindokht Helforoush et al. [1] developed a hybrid metaheuristic machine learning approach that showed promising results in classifying obesity of the CMI and VAI indices in identifying metabolic syndrome risk was approximately **85%**. risk. The proposed ANN-PSO model achieved a remarkable accuracy rate of **92%,** outperforming traditional regression methods. Koklu and Sulak et al. [2] proposed Random Forest was the most successful artificial intelligence method for accurately classified obesity. To analyze the survey data, four commonly used artificial intelligence methods in literature, namely Artificial Neural Network, K Nearest Neighbors, Random Forest and Support Vector Machine, were employed after pre-processing. As a result of this analysis, obesity classes were predicted correctly with success rates of **74.96%**, **74.03%,** **74.03%** and **87.82%**, respectively. Admojo and Rismayanti et al. [3] utilized decision tree algorithms of individuals' lifestyle and physical condition data for accuracy, precision, recall, and F1-scores. Jeong et al. [4] used DeepHealthNet, a deep learning-based system designed to predict adolescent obesity by processing complex health data. He proposed deep learning framework, DeepHealthNet, effectively trains the model using data augmentation techniques, even when daily health data are limited, resulting in improved prediction accuracy **88.42%.** Additionally, the study revealed variations in the prediction of the obesity rate between boys **93.20%** and girls **91.63%** Furthermore, Kumar et al. [5] employed a logistic regression model for effectiveness in handling large datasets and improving prediction accuracy. Paulo and Lima et al. [6] explored the use of deep neural networks for classifying obesity level with an accuracy of **96.46%**. Musa et al. [7] investigated whether the Gboost classifier achieves the highest accuracy of **99.05%** as compared to other classifiers Also, K-Nearest Neighbor gave a relatively strong accuracy of **95.74%**. Cervantes and Palacio et al. [8] also contributed to the field by estimating obesity levels based on Decision Tree, Support Vector Machine (SVM), and Simple K-Means . Mondal et al. [9] the authors developed a model for predicting childhood obesity using data from routine well-child visits.Using algorithms are logistic regression, support vector machine (SVM), random forest, artificial neural network (ANN), k-means clustering, and k-nearest neighbors.Five years of age with an accuracy of **89%**, 77%, and **89%**. Solomon et al. [10] proposed a "Hybrid Majority Voting" algorithm to improve the prediction and classification of obesity by integrating the results of multiple machine learning classifiers, including decision trees, support vector machines (SVM), and neural networks.The hybrid model achieved a high accuracy rate of **94.5%**.Lazzer et al. [11] evaluated the Cardiometabolic Index (CMI) and Visceral Adiposity Index (VAI) as predictive tools to assess metabolic syndrome risk in a sample of women with severe obesity.The predictive accuracy of the CMI and VAI indices in identifying metabolic syndrome risk was approximately 85%.Cai et al. [12] assessed the Body Roundness Index (BRI) to evaluate its effectiveness in predicting cardiovascular disease risk among hypertensive patients with obstructive sleep apnea.BRI had a predictive accuracy of approximately **88%**. Çelik et al. [13] analyzed the potential of the AST/ALT ratio as a diagnostic indicator for metabolically healthy obesity in a pediatric population and used receiver operating characteristic (ROC) curve analysis.The ROC analysis showed that the AST/ALT ratio had an accuracy rate of **82%.** Kumar et al. [14] explored predictive models for obesity levels by analyzing smoking habits.The study found random forest (**89%** accuracy) superior to stepwise linear regression (**82%**) in predicting obesity. Vera-Ponce et al. [15] conducted a systematic review and meta-analysis to examine the effectiveness of anthropometric measures, such as body mass index (BMI), waist circumference, and waist-to-hip ratio, in predicting prediabetes risk.The authors applied meta-analytic techniques, random-effects model, waist-to-hip ratio had accuracy of **87%**. Vecchiato et al. [16] examined various predictive models for cardiorespiratory fitness (CRF) specifically in patients with obesity by utilizing a cardiopulmonary exercise test registry.Approximately **90%** predictive accuracy for CRF in patients with obesity by using multiple regression analysis. Yagin et al. [17] presented a novel approach to estimating obesity levels by employing a trained neural network optimized through Bayesian techniques.Neural network achieved an impressive accuracy of approximately **92%** in estimating obesity levels. Hernandez et al. [18] investigated the relationship between continuous glucose monitor (CGM) metrics and neonatal adiposity, emphasizing how these metrics vary in pregnant individuals with obesity compared to those of normal weight. The authors employed a machine learning regression model, specifically a random forest algorithm with accuracy of approximately **85%**. Chen et al. [19] analyzed existing literature to assess the relationship between obesity and severe dengue manifestations.The researchers applied a random-effects meta-analysis model to pool data from the selected studies. Ferdowsy et al. [20] explored the application of machine learning techniques for predicting obesity risk, highlighting the increasing relevance of data-driven approaches in public health.Random forest achieved **92%** accuracy in predicting obesity risk.