

Pengembangan Model Prediksi Risiko Diabetes Berbasis Algoritma Machine Learning untuk Deteksi Dini pada Populasi Dewasa di Indonesia

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Abstrak

Penelitian ini bertujuan mengidentifikasi faktor risiko dan membangun model prediksi diabetes berbasis machine learning menggunakan data SKI 2023. Sampel terdiri dari individu usia ≥ 15 tahun. Analisis dilakukan melalui eksplorasi bivariat dan evaluasi sembilan algoritma prediktif. Hasil menunjukkan bahwa faktor usia ≥ 45 tahun, jenis kelamin, pendidikan, obesitas sentral, hipertensi, pola makan berisiko, dan aktivitas fisik berhubungan signifikan dengan diabetes. Algoritma AdaBoost memberikan performa terbaik (AUC 0,991). Penelitian ini menghasilkan mockup web "Diabetes Risk Assessment" yang berpotensi digunakan untuk skrining mandiri dan pencegahan dini di masyarakat.

This study aimed to identify risk factors and develop a diabetes risk prediction model using machine learning algorithms based on the 2023 Indonesian Health Survey (SKI). The sample included individuals aged ≥ 15 years who met the inclusion criteria. The analysis involved bivariate exploration and evaluation of nine machine learning algorithms. Results indicated that age ≥ 45 years, sex, education level, central obesity indicators (BMI, waist circumference, WHtR), hypertension, risky dietary patterns, and physical inactivity were significantly associated with diabetes. Among all models, AdaBoost achieved the highest predictive performance (AUC 0.991). The study also produced a web-based mockup system, "Diabetes Risk Assessment," offering potential for self-screening and community-level early prevention strategies.