AI - BASED DIABETES PREDICTION SYSTEM

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OVERVIEW

- Database AI Care is a cutting-edge innovation designed to revolutionize the way diabetes is diagnosed managed, and treated using artificial intelligence.
- This platforms aims to provide personalized, real time insights and recommendations to both healthcare professionals and patients

PATIENT EDUCATION

- The platform would offer educational resources on diabetes management including articles, vedios, and interactive modules.
- Patients would be encouraged to learn about their condition and how o make healthy lifestyle choices.
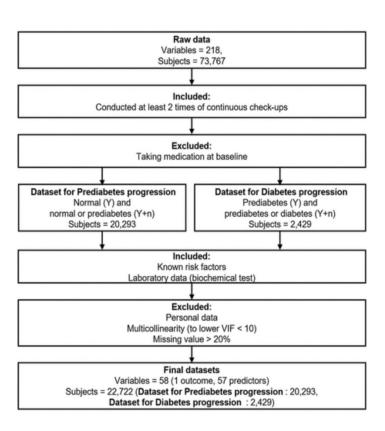
SECURE COMMUNICATION

- Security and privacy would be paramount . The plateform would use advanced encryption techniques to protect patient data and ensure HIPAA comliance

MATERIALS AND METHODS

ETHICS AND DECLARATIONS

- Clinical and laboratory varaibles were collected from the clinical data warehouse platform and the electronic medical records in Ulson University Hospital.
- Informed consent by participants was not required.
- The study was reviewed and the protocol approved by the Institutional Human Experimentation Commitee Review Board f Ulson University Hospital , Republic of korea(UUH 2020-09-003).

STUDY DESIGN

Raw data
Variables = 218,
Subjects = 73,767

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Included:
Conducted at least 2 times of continuous check-ups

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Excluded:
Taking medication at baseline

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Dataset for Prediabetes progression
Normal (Y) and
normal or prediabetes (Y+n)
Subjects = 20,293

Dataset for Diabetes progression
Prediabetes (Y) and
prediabetes or diabetes (Y+n)
Subjects = 2,429

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Included:
Known risk factors
Laboratory data (biochemical test)

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Excluded:
Personal data
Multicollinearity (to lower VIF < 10)
Missing value > 20%

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Final datasets
Variables = 58 (1 outcome, 57 predictors)
Subjects = 22,722 (**Dataset for Prediabetes progression** : 20,293,
Dataset for Diabetes progression : 2,429)

CLINICAL APPLICATIONS

- An AI based diabetes prediction system can have various clinical applications, such as early detection of diabetes, personalized treatment plans, monitoring of glucose level,and prevention of complications.
- It can assist healthcare providers in marking informed decisions and improving patient outcomes

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EXTREME GRADIENT BOOSTING

- Extreme gradient boosting is a tree based ensemble AI algorithm that uses a gradient boosting framework (Zhang and Zhan 2017),and it's characterized by an algorithm that adds a regularization term to the GBM.
- The regularization term also contributes the preventing overfitting the panalizing the model form become to complex.

MERITES OF DIABETES PREDICTION SYSTEM

- Improved accuracy in predicting diabetes risk early detection of the condition , personalized treatment plans,and proactive management of glucose level .
- It can also help in preventing complications and promoting better ovarall health outcomes.
- The system's ability to analyse the large amount of data and identify patterns enables more precise and tailored interventions

ACCURACY AND RELIABILITY

- Accuracy and reliability of a diabetic prediction system are crucial for its effectiveness.
- Machine learning algorithms pay a significant role in achieving high accuracy by analysing various features and patterns in the data.
- Additionally, rigorous evaluation and validation process help ensure the reliability of the system's prediction .
- Continuous improvement and refinement are essential to enhance the accuracy and reliability of such system overtime.

PERSONALIZED TREATMENT PLANS

- Based on the analysis of patients data, Diabetes AI care would generate personalized treatment plans.

- These plan might include medication adjustments,dietory recommendation, and exercise routines tailored to each patient's unique needs.

HEALTHCARE PROVIDER SUPPORT

- Diabetes AI care would offer a dedicated portal for healthcare providers, giving them access to their patients data and treatment plans .
- It would assist doctors in making informed decisions, tracking patient progress and adjusting treatment plans as necessary.

BENEFITS

- Improved Outcomes
- Reduces Healthcare Costs
- Enhanced Patient Engagement
- Efficient Healthcare Delivery

IMPROVED OUTCOMES

- By continuosly monitoring and analyzing patient data, diabetesAI care can help individual achieve better glucose control , reducing the risk of complications associated with diabetes.

REDUCED HEALTHCARE COST

- Timely interventions and personalized treatment plans can lead of fewer hospitalizations and emergency room visit, ultimately reducing the ovarall healthcare expenditure.

ENHANCED PATIENT ENGAGEMENT

- The educational resources and real time monitoring provided by the platform would empower patients to take control of their health and engage in proactive self-care

EFFICIENT HEALTHCARE DELIVERY

- Healthcare providers can effeciantly manage a large number of diabetes Patients, thank to the AI- driven insights and remote monitoring capabilities.

CONCLUSION

Diabetes AI care represents an innovative approach to diabetes management, leveraging AI to provide personalized, data-driven insights and recommendations to patients and healthcare providers.This comprehensive platform has the potential to improve the lives of individuals living with diabetes and reduce the burdon of this chronic condition on the healthcare system.