IJARCCE ISSN (O) 2278-1021, ISSN (P) 2319-5940

International Journal of Advanced Research in Computer and Communication Engineering

Impact Factor 8.102 ⁜ Peer-reviewed & Refereed journal ⁜ Vol. 13, Issue 6, June 2024

DOI: 10.17148/IJARCCE.2024.13642

Survey Paper on AI's Impact on Healthcare: Diabetes Research

Shweta Lokur[1], Aishwarya Mahendrakar[2], Ms.Vijayalaxmi Patil[3]

Department of MCA, K. L. S. Gogte Institute of Technology, Belagavi, Affiliated to Visvesvaraya Technological University, Belagavi, Karnataka, India[1]

Department of MCA, K. L. S. Gogte Institute of Technology, Belagavi, Affiliated to Visvesvaraya Technological University, Belagavi, Karnataka, India[2]

Department of MCA, K. L. S. Gogte Institute of Technology, Belagavi, Affiliated to Visvesvaraya Technological University, Belagavi, Karnataka, India[3]

Abstract: Artificial intelligence (AI) is rapidly transforming diabetes care by improving diagnosis and treatment. Machine learning creates algorithms that predict diabetes risk and complications. Digital therapeutics support lifestyle changes and help patients manage the disease. AI enables continuous, frictionless, remote monitoring of symptoms and biomarkers, improving decision-making for patients and healthcare providers. Social media and online communities drive patient engagement. These advances optimize resource utilization, lower blood glucose levels, reduce blood glucose variability, and improve glycemic control. AI is moving diabetes care towards data-driven precision medicine and is becoming a fundamental tool in managing this chronic disease.

Keywords: Artificial Intelligence, Diabetes, diabetes management, Machine Learning, AI applications, multiple daily injections, Automated decision support.

I. INTRODUCTION

Diabetes is an exploding and widespread disease worldwide, posing major challenges to both healthcare providers and patients. Diabetes continues to have a significant impact on global health.Diabetes is characterized by the human body's inability to produce enough insulin to effectively control blood glucose levels, leading to a variety of health problems.Risks associated with diabetes, such as chronic kidney disease and amputation, highlight the critical importance of rapid and accurate diagnosis and effective prognosis in treating diabetes and preventing severe outcomes. It can identify patients at increased risk, predict disease progression, and individually customize treatment plans. These innovations have the potential to revolutionize diabetes management by providing unprecedented insight and effectiveness to both healthcare professionals and patients. Although artificial intelligence holds great promise, its use in diabetes care raises significant challenges and ethical concerns. These issues must be addressed to ensure the appropriate and beneficial use of artificial intelligence in healthcare. Collaboration between medical staff, specialists, and artificial intelligence (AI) experts is essential to maximize outcomes[1].

AI helps scientists and doctors to better understand, treat, and prevent diabetes. She does this by analyzing lots of information about diabetes from lots of people to find important patterns and clues about why some people get diabetes and others don't. This helps create personalized plans to stop diabetes before it develops or better manage it if you already have it. AI also helps to constantly monitor blood sugar levels and quickly adjust treatment if needed. Leveraging AI, doctors can make better decisions about diagnosing and treating diabetes, making life easier and healthier for people with diabetes. By working together and leveraging smart technology, we can find new ways to fight diabetes and help people live better lives.

Diabetes is associated with a range of complications as well as significant morbidity and mortality. Artificial intelligence (AI) is widely used in four key areas of diabetes care, including automated retinal screening, clinical decision support, predictive population risk stratification, and patient self-management tools. This report aims to provide an overview. It discusses the scope and benefits of AI in diabetes prevention, diagnosis, and treatment[2]. The application of AI in diabetes is feasible, and it is desirable to efficiently process data and develop tools and devices for treatment. To provide safer technology through AI, it is recommended to identify all uncertainties for all potential technological systems and then implement safe designs, safety margins, and procedural safeguards. Advances in technology have produced wearables, smartphones, and other devices that help continuously monitor and track patients' symptoms and disease status[2].

IJARCCE ISSN (O) 2278-1021, ISSN (P) 2319-5940

International Journal of Advanced Research in Computer and Communication Engineering

Impact Factor 8.102 ⁜ Peer-reviewed & Refereed journal ⁜ Vol. 13, Issue 6, June 2024

DOI: 10.17148/IJARCCE.2024.13642

II. TYPES OF DIABETES

A. Type-1 Diabetes(T1D):

Type 1 diabetes occurs when the body's immune system mistakenly attacks and destroys insulin-producing cells in the pancreas. Without insulin, sugar can't move from the blood to cells, resulting in high blood sugar levels. The disease usually starts in children and young adults but can occur at any age. People with type 1 diabetes need to inject insulin every day to survive. Common signs include extreme thirst, frequent urination, extreme hunger or fatigue, and uncontrollable weight loss. Treatment of type 1 diabetes includes taking insulin, regularly monitoring blood glucose levels, eating a healthy diet, and exercising regularly. Artificial intelligence helps treat type 1 diabetes through the use of devices such as continuous glucose monitors (CGMs) and insulin pumps, which provide real-time blood glucose data and automatically adjust insulin doses to make it easier to maintain stable blood glucose levels[10].

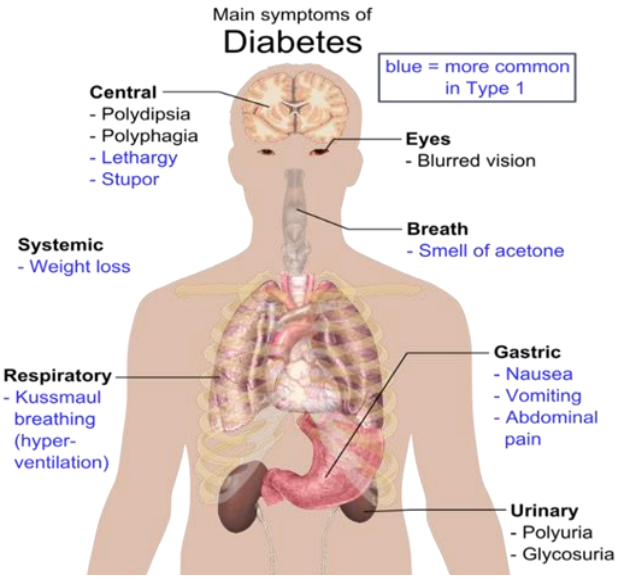

Fig1.Type-1 Diabetes[15]

AI is revolutionizing the treatment of type 1 diabetes (T1D) by leveraging data from continuous glucose monitors (CGMs), insulin pumps, wearable devices, and patient-related information. The process begins with comprehensive data collection, including blood glucose levels, insulin doses, carbohydrate intake, physical activity, and other relevant health parameters. This data is then processed to remove discrepancies, normalize values, and potentially fill missing data. Relevant features are extracted from the processed data, such as: B. Historical blood glucose levels, insulin dosing records, meal times, physical activity levels, sleep patterns, and stress factors. Machine learning models, such as regression models, decision trees, support vector machines, and neural networks, are trained using these features to predict future blood glucose levels, detect patterns indicative of hyperglycemia or hypoglycemia, and suggest adjustments to insulin doses.

AI systems to treat type 1 diabetes use diverse data to make accurate predictions and provide insights. Key data includes continuous glucose measurements from monitors (CGM), insulin doses (both regular and top-up), and dietary carbohydrate intake. It also takes into account physical activity levels (number of steps, exercise duration, intensity), physiological data (heart rate, sleep patterns), and environmental factors such as weather and temperature that may affect blood sugar levels.

Several tools and technologies are essential for AI-assisted treatment of type 1 diabetes: Continuous glucose monitors (CGMs) provide real-time glucose measurements, and insulin pumps automatically administer insulin based on those measurements. Mobile apps combine data from the CGM and pump to provide dashboards, alerts, and personalized advice. Machine learning platforms such as TensorFlow and PyTorch help build and improve predictive models. Advanced artificial pancreas systems use CGMs, insulin pumps, and AI to automate insulin delivery, mimicking the body's natural insulin control.

IJARCCE ISSN (O) 2278-1021, ISSN (P) 2319-5940

International Journal of Advanced Research in Computer and Communication Engineering

Impact Factor 8.102 ⁜ Peer-reviewed & Refereed journal ⁜ Vol. 13, Issue 6, June 2024

DOI: 10.17148/IJARCCE.2024.13642

The future of AI in treating type 1 diabetes focuses on personalization, better predictions, and the use of different types of data. AI will create customized treatment plans, taking into account genetic, lifestyle, and environmental factors. Predictive models will become more accurate, helping to better control blood sugar levels and prevent hypo- and hyperglycemia. Data from genomics and continuous health monitoring will provide a holistic view of the patient's health. Real-time decision support will provide immediate advice to patients and doctors, improving treatment adherence and outcomes. AI in telemedicine enables remote monitoring and consultation, especially in underserved areas. Advanced artificial pancreas systems aim to fully automate insulin administration and significantly improve the quality of life for people with type 1 diabetes.

Type 1 diabetes management is transforming patient care through improved prediction, monitoring, and treatment strategies. By leveraging the power of machine learning and advanced data analytics, AI can provide more accurate predictions, personalized treatment plans, and real-time decision support. These advances promise to improve health outcomes and quality of life for people with type 1 diabetes, and represent a major breakthrough in the management of this chronic disease[17].

A. Type-2 Diabetes Mellitus(T2D):

Type 2 diabetes develops when the body becomes resistant to insulin or when the pancreas doesn't produce enough insulin. It is often associated with obesity, lack of exercise, and genetic factors. This is the most common type of diabetes and usually affects adults, but due to rising obesity rates, more children are developing the disease as well. As with type 1, symptoms include increased thirst and urination, constant hunger, fatigue, and blurred vision. You may also experience slower wound healing and frequent infections.Treating type 2 diabetes involves lifestyle changes such as a healthier diet, regular physical activity, losing weight, and taking medication or insulin when needed.AI can help by predicting who is likely to develop type 2 diabetes, personalizing treatment plans, and providing diet and exercise advice through an app. It can analyze large amounts of data to provide more accurate recommendations and prevent complications[11].

AI is transforming the management of type 2 diabetes (T2D) by collecting data from health records, wearable devices, and glucose monitors. This data is cleaned and standardized before key features such as blood glucose history, medication adherence, diet, exercise, sleep, and stress are extracted. Using machine learning models such as regression, decision trees, and neural networks, AI predicts future blood glucose levels and complications. These predictions help forecast trends, identify high-risk patients, and suggest personalized lifestyle and medication changes to improve treatment outcomes.

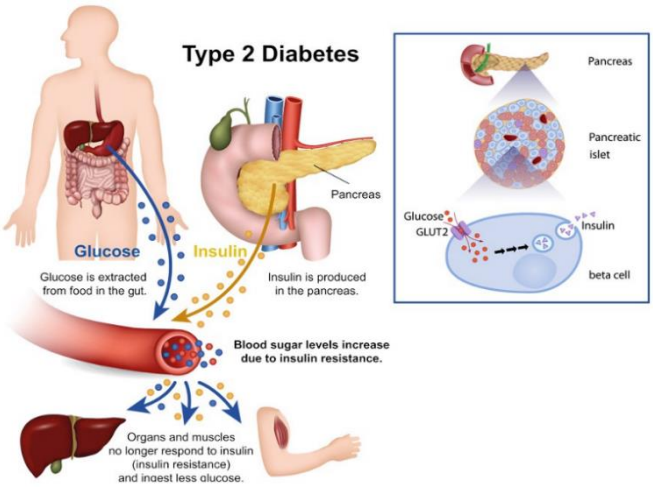

Fig2.Type-2 Diabetes[15]

AI systems to treat type 2 diabetes rely on various parameters to make accurate predictions and provide meaningful insights. These include regular blood glucose measurements from a monitor, detailed records on medication type, dosage and adherence, information on food intake, carbohydrate count and meal times, data on steps taken, exercise time and intensity, measurements like heart rate, blood pressure, weight and physical activity, behavioral data like sleep patterns, stress levels and mood, and environmental factors like weather and temperature that may affect blood glucose levels.

IJARCCE ISSN (O) 2278-1021, ISSN (P) 2319-5940

International Journal of Advanced Research in Computer and Communication Engineering

Impact Factor 8.102 ⁜ Peer-reviewed & Refereed journal ⁜ Vol. 13, Issue 6, June 2024

DOI: 10.17148/IJARCCE.2024.13642

AI uses a variety of methods to predict and treat type 2 diabetes, including using historical data and current trends to forecast future blood glucose levels to help patients avoid hyperglycemia and hypoglycemia, and identifying patients at high risk of developing complications such as cardiovascular disease, neuropathy, and retinopathy, and providing personalized advice on diet, exercise, and medication adjustments based on predictive analytics.

Several key tools and technologies support AI-powered type 2 diabetes (T2D) management: Glucose meters provide regular blood glucose data for AI analysis. Wearable devices such as fitness trackers and smartwatches monitor physical activity, heart rate, and sleep patterns. Mobile apps consolidate data from multiple sources and provide dashboards, alerts, and personalized advice. Electronic health records (EHRs) store comprehensive patient health information and support data integration. Machine learning platforms such as TensorFlow and PyTorch are used to develop and refine predictive models. Telemedicine platforms facilitate remote monitoring and consultations, thereby improving access to healthcare.

The future of AI in type 2 diabetes (T2D) management aims for personalized care, accurate predictions, and comprehensive data integration. AI creates individualized treatment plans that account for genetics, lifestyle, and environment. Improved predictive models improve blood glucose management and reduce complications. Integrating genomics, microbiome data, and continuous monitoring provides a holistic view of a patient's health. Real-time decision support systems provide immediate guidance to patients and providers, improving treatment adherence and outcomes. AI in telehealth will expand remote monitoring and consultations, especially benefiting underserved areas, and automating routine tasks will ease the burden on patients and providers, improving overall efficiency and quality of care[17].

B. Gestational Diabetes:

This type of diabetes develops during pregnancy when the body cannot produce enough insulin to meet increased needs. The disease usually disappears after the baby is born, but there is an increased risk of type 2 diabetes later in life. Since there are often no noticeable symptoms, the disease is usually discovered during a routine pregnancy test. Some women may notice increased thirst and urination.Treatment for gestational diabetes includes monitoring blood sugar levels, a balanced diet, regular exercise, and possibly insulin administration.By analysing health data, AI can predict which women are at risk for gestational diabetes and also help manage the disease by providing personalized diet and exercise recommendations through digital health tools[13].

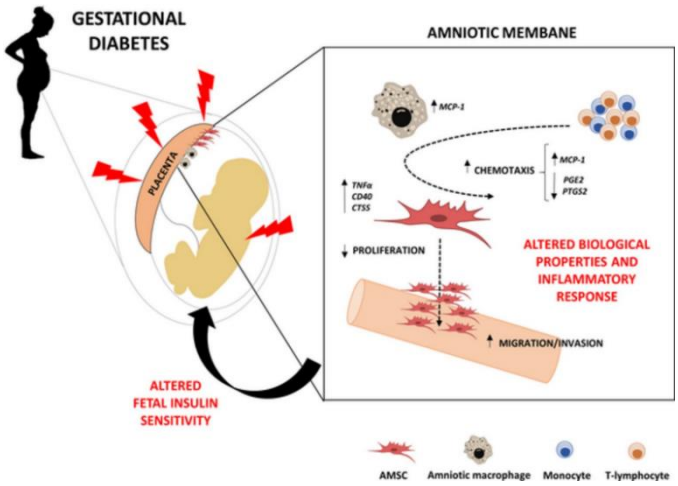

Fig3. Gestational Diabetes[16]

C. Prediabetes:

Prediabetes is when our blood sugar levels are higher than typical but not tall enough to be analyzed as Type 2 diabetes. It serves as an important warning signal and indicates an increased risk of developing type 2 diabetes, heart disease, and stroke. Causes of prediabetes include insulin resistance, obesity, improper diet, and lack of exercise. AI technology can significantly improve the treatment and prevention of prediabetes through early detection, personalized intervention, and continuous monitoring. AI algorithms analyze large amounts of data from electronic medical records, genetic information, and lifestyle factors to identify people at high risk. This early detection allows for timely lifestyle changes and preventative measures such as: B. Switching to a balanced diet, increasing physical activity, and losing weight.

IJARCCE ISSN (O) 2278-1021, ISSN (P) 2319-5940

International Journal of Advanced Research in Computer and Communication Engineering

Impact Factor 8.102 ⁜ Peer-reviewed & Refereed journal ⁜ Vol. 13, Issue 6, June 2024

DOI: 10.17148/IJARCCE.2024.13642

AI-powered mobile apps and wearable devices provide personalized recommendations and real-time feedback on diet and exercise, making it easier for individuals to maintain healthier habits. These tools use predictive analytics to forecast future blood glucose trends, allowing users to be proactive in managing them. AI-powered regular blood glucose monitoring and A1C testing provides detailed insights into an individual's progress, ensuring interventions are effective and adjustments are made in a timely manner. Overall, AI can empower prediabetes patients to take control of their health, significantly reducing the risk of developing type 2 diabetes and improving long-term health outcomes[14].

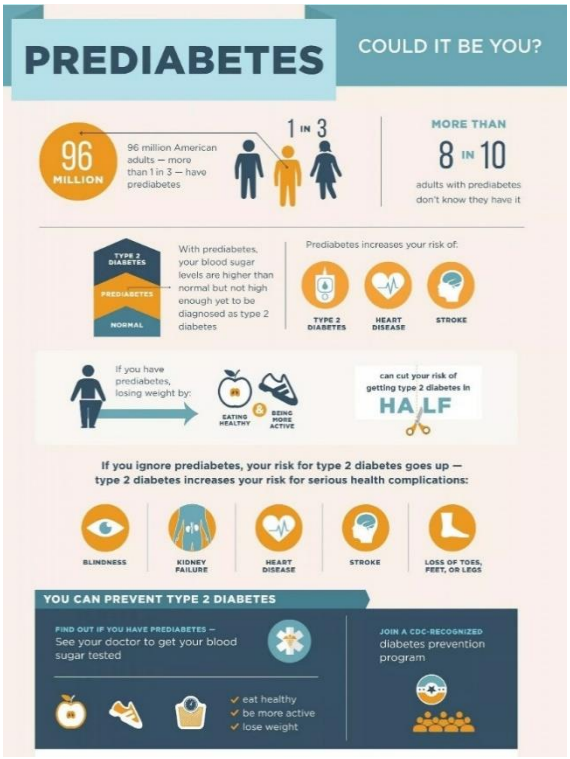

Fig4. Prediabetes[16]

D. Monogenic and Secondary diabetes:

Monogenic diabetes is a rare form of diabetes caused by mutations in a single gene and is commonly diagnosed in infants and young children. Unlike type 1 or type 2 diabetes, monogenic diabetes has a clear genetic origin and can have similar characteristics to both types, making accurate diagnosis important. AI and advanced genetic testing have significantly improved the identification and understanding of the specific genetic mutations that cause the disease. These technologies allow for accurate diagnosis and individualized treatment, such as oral medications or insulin, depending on the specific genetic mutation. Similarly, secondary diabetes resulting from other diseases or treatments, such as pancreatitis, cystic fibrosis, or long-term steroid use, presents with symptoms similar to other forms of diabetes, such as increased thirst, frequent urination, and fatigue. AI can improve the diagnosis of underlying diseases through pattern recognition and predictive analytics to support the treatment of secondary diabetes. It can also help optimize treatment plans focused on treating primary medical issues while effectively controlling blood sugar levels. AI-powered tools and apps can provide personalized recommendations for medication adjustments, dietary changes, and lifestyle modifications to improve overall disease management. Using AI and genetic testing, healthcare providers can provide more accurate, effective, and personalized care for patients with monogenic and secondary diabetes, resulting in better health outcomes[12].

III. CLINICAL SIGNIFICANCE

1. Artificial intelligence (AI) is bringing a paradigm shift in diabetes care through data-driven precision therapy.

2. AI will transform the way diabetes is prevented, detected, and treated, and could help reduce the global prevalence of by 8.8%.

IJARCCE ISSN (O) 2278-1021, ISSN (P) 2319-5940

International Journal of Advanced Research in Computer and Communication Engineering

Impact Factor 8.102 ⁜ Peer-reviewed & Refereed journal ⁜ Vol. 13, Issue 6, June 2024

DOI: 10.17148/IJARCCE.2024.13642

3. Case-based reasoning, machine learning, deep learning, and neural networks will enable predictive risk stratification of populations, automated retinal screening, improved decision-making, and self-management.

4. AI will positively impact healthcare professionals by supporting decision-making and remote monitoring[2].

IV. APPLICATIONS

1.Automated Retinal Screening: A deep learning algorithm was developed to automate the diagnosis of diabetic retinopathy. AI-based retinal screening is a feasible, accurate and widely accepted method to detect and monitor diabetic retinopathy. High sensitivity and specificity of 92.3% and 93.7%, respectively, were reported for automated retinal screening. Patient satisfaction with automated screening was also high, with 96 of 444 patients stating that they were satisfied or very satisfied with the method. A convolutional neural network (CNN) was trained on a limited dataset to generate lesion-specific probability maps for hemorrhage, microaneurysm, exudate, neovascularization, and normal retinal appearance.

2.Clinical decision support: Clinical decision support tools based on supervised machine learning have been developed to predict short-term and long-term HbA1c responses after insulin treatment initiation in patients with type 2 diabetes. These tools also help identify clinical variables that may affect a patient's HbA1c response. A generalized linear model based on elastic network regularization based on baseline HbA1c and estimated glomerular filtration rate robustly predicts HbA1c responses after insulin treatment initiation[2].

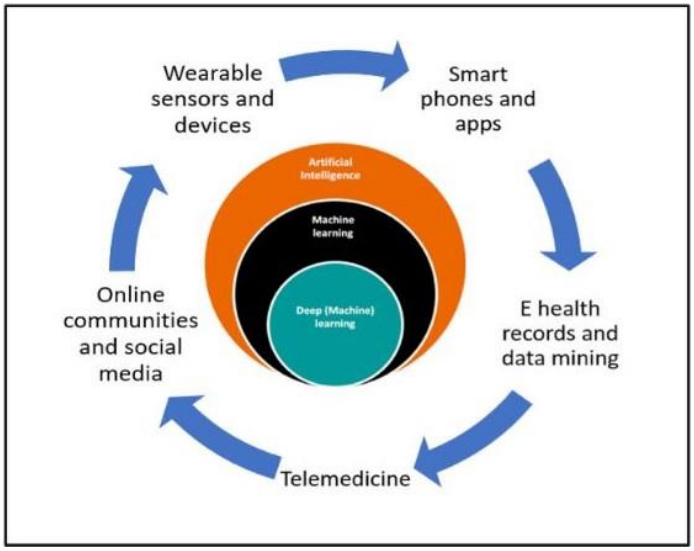

Fig5.Applications of artificial Intelligence in diabetes care[2].

3.Predictive risk stratification of population: A machine learning health recommendation system, "HRS", helped predict the risk of diseases including diabetes by analyzing patients' lifestyle, physical and mental health factors, and social network activity. Data from 68,994 healthy people and diabetic patients was used as a training dataset to predict diabetes with high accuracy (Accuracy = 0.8084 across all attributes) using decision trees, random forests, and neural networks[2].

V. LITERATURE REVIEW

Existing System: Currently, diabetes research relies on traditional methods such as clinical trials and observational studies. Clinical trials test new drugs or treatments in a controlled environment to see how well they work. Observational studies follow large groups over time to find out what factors increase the risk of diabetes or how the disease progresses. Researchers collect and analyze data from patient records, clinical tests, and questionnaires. Although these methods are important, they can be time-consuming and expensive, and are limited by the amount of data they can process and the speed at which they can be analyzed.

International Journal of Advanced Research in Computer and Communication Engineering
Impact Factor 8.102 ⁜ Peer-reviewed & Refereed journal ⁜ Vol. 13, Issue 6, June 2024
DOI: 10.17148/IJARCCE.2024.13642

Proposed System: The use of AI in diabetes research offers significant improvements over traditional methods. AI can quickly analyze large amounts of data from various sources, including electronic health records, genetic information, and data from wearable devices such as blood glucose meters. AI can find patterns and connections in the data that humans may miss, helping to identify risk factors and predict disease progression. AI can also simulate clinical trials, testing many different factors simultaneously to find the best treatment options.

AI can help personalize diabetes management. Specific lifestyle changes, such as diet and exercise plans, can be recommended, and medications can be adjusted based on an individual's genetic profile and health information. AI can also alert patients and doctors to potential complications before they occur, enabling earlier intervention. With AI, diabetes research and treatment can be made faster, more accurate, and more personalized, leading to better health outcomes.

VI. LIMITATIONS OF AI IN DIABETES RESEARCH AND TREATMENT

Undoubtedly, artificial intelligence (AI) is one of the most hotly debated topics in the medical field today. Some experts believe that AI has great potential to improve diabetes management. AI-enabled devices such as B. Continuously monitored blood glucose meters (CGMs) and insulin pumps can help treat diabetes and reduce high blood sugar levels. AI could be used to predict which patients are more likely to suffer from problems such as diabetic ketoacidosis. In addition, AI could help manage diabetes by alerting patients to regularly monitor their blood sugar levels, take their diabetes medications, exercise, plan their meals, eat nutritious foods, and make other lifestyle adjustments. Although such apps are still in the early stages of growth, they have the opportunity to help 4,444 patients better control their diabetes while preventing serious complications[9].

Machine learning cannot miraculously produce the expertise humans need to solve problems if humans don't know how to approach them. We know about robot cars because people know how to drive. Chess robots are international chess experts because humans know how to play the game. People own industrial robots because they know how to use them.There are several reasons why machine learning and AI will not be able to completely cure the diabetes crisis: First of all, artificial intelligence relies on huge amounts of information to learn and grow. When it comes to diabetes, experts don't have enough information. To build a machine learning algorithm that can predict which people are likely to develop diabetes, you need data about people's daily behavior, genetic makeup, and other medical problems like heart and kidney disease. Even if humans had all this information, it would be very difficult to put it together in a way that an artificial intelligence could understand.

Data quality and availability: Many AI models rely on large amounts of high-quality data for effective training. However, in the case of diabetes, available data is limited and the quality of the data can vary significantly, introducing potential bias and inaccuracies in AI predictions[4]. Interpretability of AI models: Although AI algorithms can provide accurate predictions, their functionality is often complex and difficult to interpret, making it difficult for medical professionals to understand the reasoning behind AI-generated diabetes treatment recommendations[5].

VII. ADVANTAGES OF AI IN THE CONTEXT OF DIABETES MANAGEMENT

Personalized treatment plans: AI algorithms can analyze large amounts of patient data and tailor treatment plans to an individual's needs, taking into account factors like lifestyle, genetics, and medical history. This leads to a more individualized and effective diabetes management strategy[6].

Early detection and prevention of disease: AI-powered predictive models can identify people who are at high risk of developing diabetes or its complications, allowing for early intervention and preventive measures to slow the progression of the disease[7].

Real-time monitoring: AI-based systems such as wearable devices and continuous glucose monitors enable real-time monitoring of blood glucose levels and other relevant physiological parameters, allowing for timely adjustments in treatment plans and lifestyle interventions[6].

Improved clinical decision support: AI-powered clinical decision support systems can help healthcare providers make evidence-based decisions regarding diagnosis, treatment selection, and risk stratification for diabetes patients, potentially improving clinical outcomes and reducing medical errors[5].

International Journal of Advanced Research in Computer and Communication Engineering

Impact Factor 8.102 ⁜ Peer-reviewed & Refereed journal ⁜ Vol. 13, Issue 6, June 2024

DOI: 10.17148/IJARCCE.2024.13642

Efficiency and cost reduction: By automating repetitive tasks such as data analysis and patient monitoring, AI technology can streamline healthcare workflows, reduce administrative burdens, and lower healthcare costs associated with diabetes care[8].

VIII. ARTIFICIAL INTELLIGENCE TO PREDECT DIABETIC RETINOPATHY

The most common outcome of the disease is diabetic retinopathy. Traditional treatment of diabetes and diabetic retinopathy is unorganized and step-by-step. In some cases, it is one of the most expensive and costly treatments. To bridge these discrepancies in healthcare, innovative approaches incorporating digital technologies are needed. Artificial intelligence systems have demonstrated exceptional sensitivity in diagnosing retinopathy caused by diabetes. By analyzing patient records, artificial intelligence algorithms can detect early signs of acute retinopathy with the same accuracy as endocrinologists. A set of deep learning-based automated DR screening algorithms was presented and showed significant specificity and sensitivity (>90%). However, due to limitations of freely available datasets, such deep learning algorithms do not perform well in clinical scenarios[1].

IX. CONCLUSION

The integration of artificial intelligence in diabetes diagnosis, screening, and prognosis is expected to revolutionize diabetes diagnosis and prognosis research. Algorithms using artificial intelligence haEllahham, S. (2020). Artificial Intelligence: ve demonstrated excellent accuracy in predicting and diagnosing diabetes, allowing for immediate action and personalized treatment strategies.

Furthermore, the involvement of AI in drug discovery will open up new treatment options for efficient diabetes management. Although issues such as data quality, comprehension, and privacy issues remain, these limitations are being addressed with the continued advancement of artificial intelligence and enhanced research efforts. The foreseeable future of diabetes treatment looks promising with improved patient outcomes and better management of common chronic diseases through the potential of artificial intelligence and collaboration with medical professionals.

The effect of AI on healthcare, mainly in handling diabetes, is profound. Through AI-pushed technology like predictive analytics, far flung monitoring, and customized remedy plans, healthcare carriers can provide greater specific diagnoses, proactive interventions, and tailor-made care to patients. AI`s cappotential to research sizeable quantities of records additionally allows early detection of diabetes-associated complications, main to higher consequences and high-satisfactory of existence for patients. As AI maintains to evolve, its function in revolutionizing diabetes care guarantees even extra improvements in disorder control and affected person well-being.

REFERENCES

[1]. Binhowemel, S., Alfakhri, M., AlReshaid, K., & Alyani, A. (2023). Role of artificial intelligence in diabetes research, diagnosis, and prognosis: A narrative review. Journal of Health Informatics in Developing Countries, 17(02).
[2]. Ellahham, S. (2020). Artificial Intelligence: The future for diabetes care. The American Journal of Medicine, 133(8), 895-900.
[3]. Sharma, A., Prasad, K. D. V., Chakrasali, S. V., Gowda, D. V., Kumar, C., Chaturvedi, A., & Pazhani, A. A. J. (2023). Computer vision based healthcare system for identification of diabetes & its types using AI. Measurement:Sensors.
[4]. Cho, N.H., Shaw, J.E., Karuranga, S. et al. IDF Diabetes Atlas: Global estimates of diabetes prevalence for 2017 and projections for 2045.Diabetes Res Clin Pract 138, 271–281 (2018).)
[5]. Cabitza, F., Rasoini, R., & Gensini, G. F. (2017). Unintended Consequences of in Medicine. JAMA, 318(6), 517–518.)
[6]. Jiang, F., Jiang, Y., Zhi, H., Dong, Y., Li, H., Ma, S., et al. (2017). Machine Learning in healthcare: past,present and future.Stroke and Vascular Neurology, 2(4), 230–243.)
[7]. Rajkomar, A., Dean, J., & Kohane, I. (2019).Machine Learning in Medicine. New England Journal of Medicine, 380(14), 1347–1358.)
[8]. Mishra, D. K., & Shukla, S. (2020). Role of artificial intelligence in diabetes management. International Journal of Engineering Technologies and Management Research, 7(7), 80-88.
[9]. Wu, J.-H., Liu, T. Y. A., Hsu, W.-T., Ho, J. H.-C., & Lee, C.-C. (2021). Performance and limitation of machine learning algorithms for diabetic retinopathy screening: Meta-analysis. Journal of Medical Internet Research, 23(7), e23863.

International Journal of Advanced Research in Computer and Communication Engineering

Impact Factor 8.102 ⁜ Peer-reviewed & Refereed journal ⁜ Vol. 13, Issue 6, June 2024

DOI: 10.17148/IJARCCE.2024.13642

[10]. Tyler, N. S.; Jacobs, P. G. Artificial Intelligence in Decision Support Systems for Type 1 Diabetes. Sensors 2020, 20, 3214.

[11]. Abhari, S., Niakan Kalhori, S. R., Ebrahimi, M., Hasannejadasl, H., Garavand, A. Artificial intelligence applications in type 2 diabetes mellitus care: focus on machine learning methods. Healthcare Informatics Research 2019;25(4):248-256.

[12]. Abreu Miss, G. de M., Tarantino, R. M., da Fonseca, A. C. P., de Souza, R. B., Soares, C. A. P. D., Cabello, P. H., Rodacki, M., Zajdenverg, L., Zembrzuski, V. M., Campos Junior, M. PDX1-MODY: A rare missense mutation as a cause of monogenic diabetes. European Journal of Medical Genetics 2021;64(5):104194.

[13]. Shen, J., Chen, J., Zheng, Z., Zheng, J., Liu, Z., Song, J., Wong, S. Y., Wang, X., Huang, M., Fang, P. H., Jiang, B., Tsang, W., He, Z., Liu, T., Akinwunmi, B., Wang, C. C., Zhang, C. J. P., Huang, J., Ming, W. K. An innovative artificial intelligence–based app for the diagnosis of gestational diabetes mellitus (GDM-AI): Development study. Journal of Medical Internet Research 2020;22(9).

[14]. Buccheri, E., Dell'Aquila, D., Russo, M. Artificial intelligence in health data analysis: The Darwinian evolution theory suggests an extremely simple and zero-cost large-scale screening tool for prediabetes and type 2 … Diabetes Research and Clinical Practice2021;174:108722.

[15]. Google:https://www.istockphoto.com/photos/types-of-diabetes.

[16]. Google:https://my.clevelandclinic.org/health/diseases/7104-diabetes.

[17]. Juan Li, Jin Huang, Lanbo Zheng, Xia Li. "Application of artificial intelligence in diabetes education and management: present status and promising prospect." Frontiers in Public Health, vol. 8, article 521222, 2020.