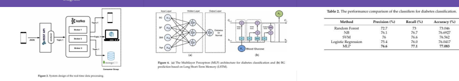
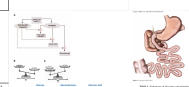
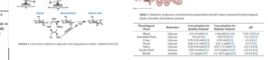
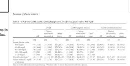
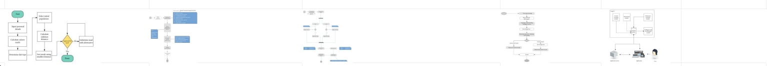
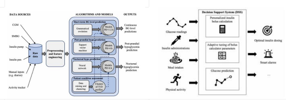
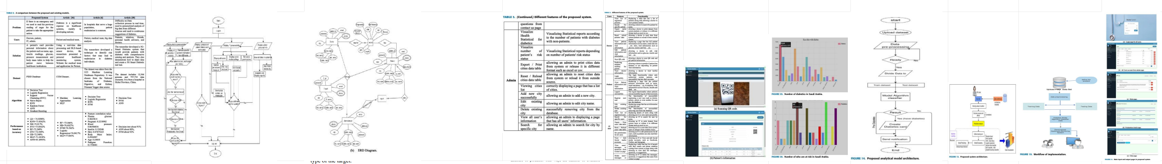
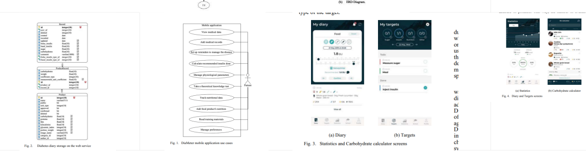
Diabetes Care Reimagined: An Integrated System for Real-time Monitoring, Dietary Management, and Personalized Healthcare

Paper Identity	Journal/ Conference	Paper Link	Publisher	Download Status	What	How	Result	Gaps	Datasets used	Diagram
1. A Personalized Healthcare Monitoring System for Diabetic Patients by Utilizing BLE-Based Sensors and Real-Time Data Processing	Sensors	https://www.mdpi.com/1424-8220/18/7/2183	MDPI	YES	-BLE-based Monitoring System -Data Processing and Storage -Machine Learning for Diabetes Management	**Type**: developing and testing a healthcare monitoring system for diabetic patients with integration of BLE-based sensors, real-time data processing, and machine learning algorithms to manage and predict diabetes-related health metrics. **Data collection purpose:** Health Monitoring and Management, Data-Driven Insights and Predictions, Real-time Health Interventions. **Data Collection Methods** :1. BLE-based wearable sensors including blood glucometers, smart bands, blood pressure monitors, and weight scales.2. Prototype Android app for receiving and transmitting sensor data. 3. Implemented using Apache Kafka to handle the incoming data streams and MongoDB for data storage were used for analyzing the collected data. 5. A Multilayer Perceptron (MLP) is used for diabetes classification, and Long Short-Term Memory (LSTM) networks are used for predicting future BG levels. **Targeted/Stakeholders:** Adults with Type 1 or Type 2 diabetes and Medical professionals who monitor and treat diabetic patients.	**Methodology**: BLE-based Sensor Collect and transmit vital signs data. Apache Kafka for data streaming and MongoDB for storing the unstructured data. Data is sent from sensors to smartphones, then to a remote server via a REST API. **Data Analysis:** Classification and Prediction: MLP: For early prediction of diabetes. LSTM: For predicting future blood glucose levels.	1. Limited to PIMA Indian women, restricting the ability to generalize the classification model for broader applications. 2. Collected real-case implementation datasets will enhance the classification model's accuracy and robustness for diverse populations and purposes.	the PIMA Indians Diabetes Database 768 patients, out of which 500 tested negative (normal) and 268 tested positive for diabetes. included attributes such as the number of pregnancies, 2-hour glucose tolerance, diastolic blood pressure, triceps skinfold, 2-hour serum insulin, body mass index (BMI), diabetes pedigree function, and age. Only four attributes were utilized for training the classification model: 2-hour glucose tolerance (BG), diastolic blood pressure (BP), BMI, and age.	
2. Features of Mobile Diabetes Applications: Review of the Literature and Analysis of Current Applications Compared Against Evidence-Based Guidelines	Journal of medical Internet research	https://www.jmir.org/2011/3/e65	JMIR Publications	YES	- Assessing Diabetes Mobile App - Feature Discrepancy Analysis - Clinical Guideline Comparison	**Type**: Analyze the features of diabetes management mobile applications and identify gaps between their capabilities and evidence-based clinical guidelines, targeting patients, researchers, developers, and healthcare providers. **Data Collection Purpose**: To analyze the features and functionality of diabetes management mobile applications and to identify the gaps between current mobile application capabilities and the requirements derived from evidence-based clinical guidelines. **Data collection**:Online Journal Databases and Gray Literature **Targeted stakeholders**:Patients with Diabetes, Researchers and Developers, Healthcare Providers	**Methodology:** Feature Analysis, Data Extraction, Verification and Validatio. **Data Analysis:** prevalence of each feature was calculated and compared against the requirements from clinical guidelines andnalysis included a breakdown of features per mobile platform and source (online markets vs. literature).	1. Limited integration of social media functionalities. 2. Bias towards insulin-based solutions, neglecting the majority of type 2 diabetes patients.		
3. Calibration of Minimally Invasive Continuous Glucose Monitoring Sensors: State-of-The-Art and Current Perspectives	Biosensors	https://www.mdpi.com/2079-6374/8/1/24	MDPI	YES	-Wearable devices for real-time glucose monitoring -Sensor Technology -Calibration Process - Advancements	**Type:** A review focusing on the evolution of calibration processes in minimally invasive continuous glucose monitoring (CGM) sensors **Data Collection Purpose:** to review the calibration processes used in minimally invasive continuous glucose monitoring (CGM) sensors, highlighting the evolution from simple linear regression techniques to more sophisticated algorithms. **Data Collection:** No primary data collection was conducted. Instead, performed an extensive review of existing literature on CGM sensor calibration techniques and the performance of commercial CGM devices. **Target Stakeholders:** Diabetic patients who require accurate and continuous glucose monitoring.Healthcare providers who rely on CGM devices for managing patient care.Researchers and developers focused on advancing CGM technology and calibration methods	**Methodology:** comprehensive literature review and comparative analysis that contextualizes the calibration problem in the first-generation CGM sensors and then examines recent advancements in calibration algorithms. **Data Analysis**: categorizing the calibration techniques and comparing their effectiveness and evaluating the accuracy, frequency of calibration, and user acceptability of different methods also provides examples of sensor inaccuracies and discuss the limitations of early calibration methods.	necessity for extensive real-world validation and clinical trials to assess the efficacy and reliability of advanced calibration algorithms for CGM sensors in diverse patient populations.		
4. Is Type 2 Diabetes an Operable Intestinal Disease?: A provocative yet reasonable hypothesis Francesco Rubino, MD	Diabetes care	https://diabetesjournals.org/care/article/31/Supplement_2/S290/24821/Is-Type-2-Diabetes-an-Operable-Intestinal-Disease	American Diabetes Association	YES	-Diabetes Epidemic and Surgical Solutions -Gastrointestinal Surgery and Diabetes Management -Proximal Intestinal Involvement in Diabetes	**Type**: review of the potential role of gastrointestinal surgery in the treatment of type 2 diabetes, emphasizing the hypothesis that diabetes may be characterized as an operable intestinal disease. **Data Collection Purpose:** to provide evidence supporting the notion that surgical interventions targeting the gastrointestinal tract could offer a novel approach to understanding and treating diabetes. **Data Collection:** from various sources, including animal studies, clinical trials, and meta-analyses, to support their arguments and hypotheses. **Targeted Stakeholders:** clinicians, researchers, and policymakers involved in diabetes management and surgical interventions.	**Methodology:** a narrative review approach, synthesizing findings from multiple studies to build a cohesive argument. **Data Analysis**: a qualitative synthesis of the literature, identifying patterns, trends, and gaps in existing research to support their argument.	N/A		
5. Glucose Sensing for Diabetes Monitoring: Recent Developments	Sensors	https://www.mdpi.com/1424-8220/17/8/1866	MDPI	YES	A review of recent advances that focus on -non-invasive glucose monitoring -Exploration of alternative physiological fluids -Potential for continuous monitoring	**Type:** review of glucose monitoring methods, emphasizing non-invasive techniques across multiple biological fluids. **Data Collection Purpose:** to provide a comprehensive analysis of glucose monitoring methods, with a particular focus on non-invasive techniques using various biological fluids other than blood, such as interstitial fluid, sweat, breath, saliva, and ocular fluid. **Data Collection:** by reviewing existing literature and commercial products to gather data on the current state of glucose monitoring technologies. This includes both invasive and non-invasive methods. **Target Stakeholders:** Diabetic Patients, Healthcare Providers, Researchers and Developers	**Methodology**: not specific **Data Analysis:** Categorization, Comparison with Clinical, Evaluation of Non-Invasive Methods	the need for further clinical evaluation and a deeper understanding of the relationship between blood and other physiological fluids in wearable sensors to provide actionable health insights and integrate into clinical practices effectively.		
6. Accuracy of the GlucoWatch G2 Biographer and the Continuous Glucose Monitoring System During Hypoglycemia	Diabetes care	https://diabetesjournals.org/care/article/27/3/722/23026/Accuracy-of-the-GlucoWatch-G2-Biographer-and-the	American Diabetes Association	YES	-Assessing glucose monitoring devices. -Hypoglycemia detection in youth. -Reliability of CGMS and GW2B	**Type:** evaluating the accuracy of the GlucoWatch G2 Biographer and continuous glucose monitoring system in detecting hypoglycemia in children with type 1 diabetes. **Data Collection Purpose:** to assess the accuracy of two continuous glucose monitoring devices, GlucoWatch G2 Biographer (GW2B) and continuous glucose monitoring system (CGMS), during hypoglycemia in children with type 1 diabetes. **Data Collection:** by utilizing both GW2B and CGMS devices during a 24-hour clinical research center (CRC) admission involving children aged 1-18 years with type 1 diabetes **Target:** children and adolescents with type 1 diabetes	**Methodology:** was conducted using a prospective observational design. The eligibility criteria included a clinical diagnosis of type 1 diabetes and insulin therapy for at least 1 year. **Data Analysis:** Accuracy analysis were conducted to compare sensor glucose values with reference serum glucose measurements. Sensitivity and false-alarm rates were calculated to assess the devices' performance in detecting hypoglycemia.	Scarcity of data regarding the accuracy of continuous glucose monitoring devices in children, particularly during acute hypoglycemia, emphasizing critical concerns in managing type 1 diabetes in this demographic.		
7. Design and Development of Diabetes Management System Using Machine Learning	International Journal of Telemedicine and applicaations	https://www.hindawi.com/journals/ijta/2020/8870141/	Hindawi	YES	-Diabetes management with AI assistance. -Machine learning for personalized care. -Software system for diabetes control.	**Type**: Experiences of women living with pelvic girdle pain (PGP) during pregnancy. **Data Collection Purpose:** Gather existing qualitative studies to understand the lived experiences, challenges, and coping mechanisms of pregnant women suffering from PGP. **How Data Was Collected**: Conducting a comprehensive literature search and review of qualitative studies that focus on pregnant women with PGP. **Target Stakeholders:** pregnant women experiencing pelvic girdle pain.	**Methodology**: Qualitative literature review. The researchers systematically searched for and reviewed qualitative studies that met specific inclusion criteria, focusing on the experiences of pregnant women with PGP. **Data Analysis:** Thematic synthesis, they extracted key themes and patterns from the reviewed studies to identify common experiences, challenges, and coping strategies reported by the women.	NOT MENTIONED SPECIFICALLY!!	1. Images of various food items, both high-quality and low-quality, for training and testing the food recognition model. 2. blood glucose readings and activity tracking data were collected to assess the effectiveness of the diabetes management platform.	
8. Revolutionizing Dietary Monitoring: A Comprehensive Analysis of the Innovative Mobile App for Tracking Dietary Composition	INTERNATIONAL JOURNAL OF INNOVATIONS IN ENGINEERING RESEARCH AND TECHNOLOGY VOLUME	https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4592007	SSRN	YES	-Evaluation of Speak4Diet app effectiveness. -AI-based dietary intake monitoring. -Potential for improving dietary habits.	**Type:** a mixed-methods research project focusing on evaluating the effectiveness of the Speak 4 Diet mobile app for tracking dietary composition. **Purpose:** to collect data on dietary intake, user demographics, medical history, physical activity levels, user satisfaction, and engagement with the Speak 4 Diet app and to understand the app's effectiveness in monitoring dietary intake, identifying nutrient deficiencies, and potentially improving dietary habits and overall health. **Data Collection:** Data were collected from a convenience sample of 200 adults aged 18-65 years recruited through online platforms and local advertisements. Participants were required to own a smartphone and have internet access. They used the Speak 4 Diet app to input data on their daily food and drink intake over a 12-week period. Additionally, baseline data on demographic characteristics, medical history, and physical activity levels were collected. **Target:** adults aged 18-65 years interested in monitoring and potentially improving their dietary habits and overall health using the Speak 4 Diet app.	**Methodology:** a mixed-methods approach, including app selection, data collection, user survey, app feature evaluation, nutritional analysis accuracy assessment, user experience evaluation, longitudinal analysis, data privacy and security investigation, data analysis, conclusion, recommendations, and ethical considerations. **Data Analysis:** Data analysis involves descriptive statistics to summarize the study population characteristics and dietary intake. Pearson's correlations were used to examine relationships between dietary intake and health outcomes. Statistical software such as SPSS was utilized for analysis. Qualitative analysis was conducted on user feedback from surveys to gain insights into user satisfaction and behavior.	lack of the Speak4Diet app's long-term effectiveness, nutritional analysis accuracy, user engagement strategies, diversity considerations, and comparative assessments.	sample of 200 adults aged 18-65 years for a 12-week period to collect data on - dietary intake, - demographics, -and health markers, utilizing the Speak4Diet app for data collection and analysis.	
9. Review Advanced Diabetes Management Using Artificial Intelligence and Continuous Glucose Monitoring Sensors	Sensors	https://www.mdpi.com/1424-8220/20/14/3870	MDPI	YES	-AI-enhanced CGM sensors for T1D. -Decision support systems for diabetes. -Personalized insulin dosing with AI.	**Type:** Literature review and development of decision support systems (DSS) for advanced management of type 1 diabetes (T1D) using artificial intelligence (AI) and continuous glucose monitoring (CGM) sensor data. **Purpose of data collection:** to review the state-of-the-art methodologies utilizing AI and CGM sensors for decision support in advanced T1D management, including techniques for personalized insulin bolus calculation, adaptive tuning of bolus calculator parameters, and glucose prediction and to provide personalized recommendations about therapy adjustments to patients. **How data were collected:** literature review of existing research and development of algorithms and software applications for T1D therapy management using AI and CGM sensor data. Simulation models, such as the UVa/Padova T1D Simulator, were also utilized for testing and validation purposes. **Stakeholders:** patients with T1D and healthcare professionals involved in diabetes management, such as diabetologists, certified diabetes educators, and clinicians.	**Methodology:** review and synthesis of existing literature on AI-based approaches for T1D therapy management, as well as the development and validation of decision support algorithms and software applications using CGM sensor data. **Data Analysis:** assessing the performance of AI algorithms and decision support systems in terms of glycemic control metrics, such as blood glucose risk index (BGRI), time in euglycemia, hypoglycemia and hyperglycemia. Performance was evaluated using simulation data and, in some cases, compared to existing standard formulas or algorithms. Further validation through clinical trials was recommended to assess safety and effectiveness in real-world settings.	1.Require further validation of AI-based decision support systems in real-world, free-living conditions 2. Need for clinical trials to confirm the safety and effectiveness of new data-driven formulas for insulin dosing derived from machine learning techniques		
10. Diabetes Digital App Technology: Benefits, Challenges, and Recommendations.	Diabetes Care	https://diabetesjournals.org/care/article/43/1/250/35864/Diabetes-Digital-App-Technology-Benefits	American Diabetes Association	YES	- Diabetes digital health technology overview. - Regulatory challenges in app safety. - Recommendations for improving diabetes apps.	**Type:** Consensus Report by the European Association for the Study of Diabetes (EASD) and the American Diabetes Association (ADA) Diabetes Technology Working Group. **Purpose of Data Collection:** to review the current landscape of available diabetes digital health technology and to highlight issues faced by the diabetes community and provide recommendations for addressing these challenges. **Data Collection Method:** reviewing existing literature, guidelines, and regulatory frameworks related to diabetes digital health technology. **Target Stakeholders:** Regulatory authorities, policy makers, professional organizations, researchers, product manufacturers, healthcare professionals, and people with diabetes.	**Methodology:** Comprehensive review and synthesis of available evidence, regulations, and practices related to diabetes digital health technology. The authors provided insights and recommendations based on their expertise and analysis of the current landscape. **Data Analysis:** ynthesizing information from various sources to identify key issues and challenges in the field of diabetes digital health technology.	1.Insufficient evidence of clinical validity, effectiveness, accuracy, and safety of digital health technology for diabetes, poor usability, interoperability issues 2. need for more systematic guidelines, improved accessibility of safety reports, increased investment in gathering clinical data, enhanced accessibility and security of diabetes mobile apps, and greater communication and cooperation across stakeholder groups.		
11. Supporting people with type 2 diabetes in effective use of their medicine through mobile health technology integrated with clinical care (SuMMiT-D pilot): results of a feasibility randomised trial		https://link.springer.com/article/10.1186/s40814-023-01429-5	Springer	YES	- Mobile phone intervention for diabetes. - Feasibility of message-based self-management.	**Type:** Feasibility randomized trial evaluating the effectiveness of mobile health technology in promoting medication adherence among people with type 2 diabetes. **Purpose:** To inform the design of a future large-scale clinical trial in the UK and assess the feasibility of recruitment, technology use, follow-up, and data collection. **Data Collection:** Collected demographic data, medication adherence using the Medication Adherence Report Scale (MARS), health status using the EuroQol 5-Dimension, 5-Level (EQ-5D-5L) scale, technology acceptance, and healthcare services use. Also collected clinical data from medical records including HbA1c, blood pressure, cholesterol, and weight. **Stakeholders:** Adults (≥35 years) with type 2 diabetes in England.	**Methodology:** Multicentre individually randomized controlled trial in primary care settings, recruiting from 16 general practices. Participants were randomly allocated to receive SMS text messages promoting medication adherence or usual care. **Data Analysis:** Analyzed recruitment rates, retention, medication adherence, health status, and healthcare services use. Used statistical analysis including ANCOVA and log-binomial regression models for secondary outcomes. Reviewed qualitative data for feasibility and acceptability.	Challenges in collecting clinical data from medical records and identifying lipid measurements accurately.	1. A dataset appears to be a collection of demographic, clinical, and lifestyle variables collected from individuals, possibly as part of a study or survey. The variables include characteristics such as age, gender, height, weight, BMI, smoking status, duration of type 2 diabetes, ethnicity, education level, blood pressure, medical history (e.g., previous myocardial infarction, stroke), and other health-related metrics (e.g., HbA1c levels, cholesterol levels). 2. A dataset comprises clinical review notes featuring health parameters like height, HbA1c, cholesterol levels, blood pressure, weight, and occurrences of medical events, alongside smoking status and self-reported questionnaire results, likely intended for healthcare assessment and research analysis.	
12. An Analytical Predictive Models and Secure Web-Based Personalized Diabetes Monitoring System	IEEE Access	https://ieeexplore.ieee.org/abstract/document/9906983	IEEE	YES	-Predictive model for type-2 diabetes. -Web-based personalized monitoring system. -Machine learning algorithms for prediction.	**Type:** an analytical predictive model using machine learning techniques and a web-based personalized diabetes monitoring system to predict type-2 diabetes and enhance patient treatment. **Purposes:** includes the medical history of patients, vital data such as insulin records, and possibly other relevant health indicators. The purpose of collecting this data is to train machine learning algorithms for predicting type-2 diabetes and to monitor patients' health status in real-time. **Data collection :**does not mention conducting any specific surveys or in-field studies. involve accessing patient medical records and utilizing IoT devices for continuous monitoring. **Targeted stakeholders :** patients at risk of or diagnosed with type-2 diabetes, as well as healthcare professionals involved in patient care and treatment.	**Methodology:** employed machine learning techniques to develop an analytical model for predicting type 2 diabetes, utilizing two datasets: Synthetic dataset (SD) and PIMA diabetes dataset (PIDD). Data preprocessing involved replacing missing values and feature selection, followed by model training using nine machine learning algorithms. The proposed system also included a web-based platform with features such as QR card system, communication tools, and data visualization. Methodology: Utilized Python for model development, MySQL for database management, and various web technologies (HTML, PHP, CSS, JavaScript) for website implementation. **Data Analysis:** performance of various classification algorithms including Decision Tree Classifier (DTC), Random Forest (RF), Logistic Regression (LR), Artificial Neural Network (ANN), Naive Bayes (NB), K-Nearest Neighbors (KNN), Support Vector Classifier (SVC), Gradient Boosting (GB), and Multilayer Perceptron (MLP) was evaluated using performance metrics such as accuracy, recall, and precision. They utilized K-fold cross-validation to assess the models' performance on both PIDD and SD datasets.	Future work could focus on expanding the monitoring system to accommodate other chronic diseases, automating diabetes analysis with more machine learning algorithms, incorporating image and audio data analysis, and adding features such as medication management, alerts, and nutrition programs for enhanced patient care.	Synthetic dataset PIMA Diabetes Dataset	
13. DiaMeter a Mobile Application and Web Service for Monitoring Diabetes Mellitus	2020 Ural Symposium on Biomedical Engineering, Radioelectronics and Information Technology (USBEREIT)	https://ieeexplore.ieee.org/abstract/document/9117654	IEEE	YES	-Mobile app for diabetes managemnet -Simplifies disease monitoring , improves health -Tracks medical data, insulin doses	**Type:** The DiaMeter app is a mobile application designed to assist individuals with diabetes in managing their condition. **Purpose :** to collect comprehensive diabetes diary data, including blood sugar levels, insulin doses, meal details, and carbohydrate intake and to gather data on user interaction with the application and its impact on their diabetes management. **How they collected data:** Data was collected through the DiaMeter mobile application and web service. Users entered their medical data into the app, which synchronized with a web service storing and managing this information. The application tracked user activity and medical entries. **Stakeholder:** people with diabetes, particularly those requiring regular monitoring and management of their condition, children and adolescents with type 1 diabetes.	**Method:** The development involved creating a database schema with 17 tables for storing user data, implementing a web service for data synchronization, and developing a user-friendly interface. Key screens included a diary for efficient data entry using sliders and keyboard input, a targets screen for setting reminders, a statistics screen with visual charts, and a carbohydrate calculator to help users manage their diet. **Data analysis:**For instance, a subset of 300 users with initially high blood sugar levels was analyzed to observe changes after using the application for more than two months. The analysis focused on changes in average blood sugar levels and their variability. Another study assessed the impact of the app on self-control among children and adolescents, showing positive outcomes in diabetes management.		Blood sugar levels Insulin dosage Food intake (including carbohydrates) Medical therapy information Physiological parameters (e.g., weight, height) Reminders and targets for diabetes management tasks	

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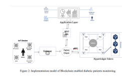
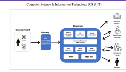
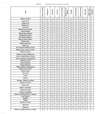
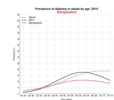
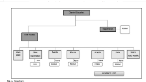
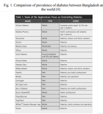
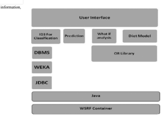
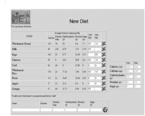
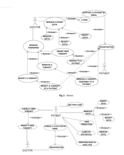
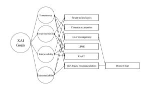
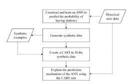
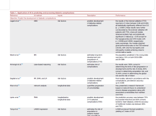
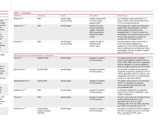
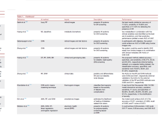
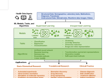
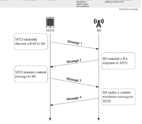
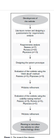
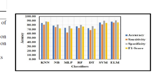
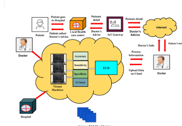
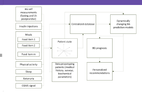
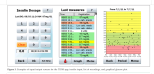
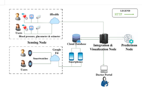
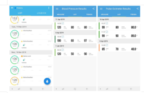
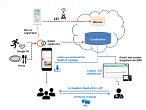
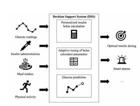
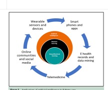
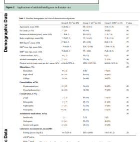
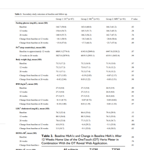
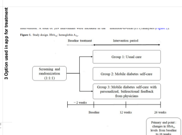
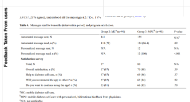
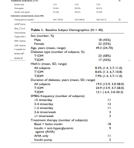
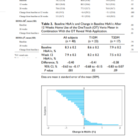
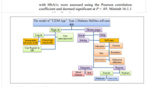
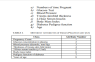
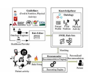
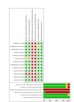
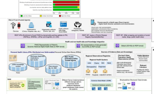
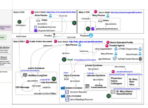
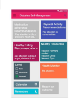
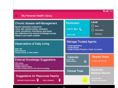
14. Blockchain Enabled Diabetic Patients' Data Sharing And Real Time Monitoring	**Embedded Systems and Applications (EMSA 2022)**	https://www.researchgate.net/publication/359530693_Blockchain_Enabled_Diabetic_Patients'_Data_Sharing_and_Real_Time_Monitoring		**YES**	-Blockchain-based diabetic patient monitoring platform. -Continuous blood sugar level monitoring. -Secure data sharing with healthcare practitioners.	**Type:** the focus is on proposing a conceptual framework and model for a blockchain-enabled platform for diabetic patient data sharing and monitoring **Purpose of Data Collection:** to enable continuous monitoring of diabetic patients, facilitate secure and private data sharing between patients, healthcare practitioners, and caregivers, and improve the management and control of diabetes through real-time monitoring and telemedicine. **Data Collection Method:**Iot Sensor was used to measure blood sugar levels and other vital signs. These sensors then transmit the data to a blockchain network where it is stored in an immutable ledger(Hyperledger). **Target Stakeholders:** Diabetic patients , healthcare paracticioners, caregivers of diabetic patients.	**Methodology:** a blockchain-based platform utilizing IoT sensors to measure vital signs, with a Raspberry Pi acting as a gateway to connect these devices to the Hyperledger Fabric blockchain. Smart contracts will manage notifications, data access permissions, and feedback, while the application layer provides a user interface for patients and healthcare providers to visualize and manage the data. **Data Analysis:** Phase 1 involves using Hyperledger Fabric to validate the conceptual model. Phase 2 focuses on developing a custom blockchain with a novel Proof of Review (PoR) consensus model to enhance performance, efficiency, and scalability. Data analysis will compare the performance of Hyperledger Fabric and the custom PoR blockchain, evaluating their efficiency, scalability, and effectiveness in real-time monitoring of diabetic patients.	Blockchain-based platform for continuous monitoring of diabetic patients addressing data security and privacy concerns and implementing a novel consensus model for efficiency and scalability.	blood sugar data,medication data,nutrition data,weight data,exercise data and sleep data	 Figure 2: Implementation model of Blockchain enabled diabetic patients monitoring. Computer Science & Information Technology (CS & IT) 231  Figure 1: The proposed conceptual architecture
15. A Review on Diabetes Patient Lifestyle Management Using Mobile Application	**2015 18th International Conference on Computer and Information Technology (ICCIT)**	https://ieeexplore.ieee.org/abstract/document/7488100	**IEEE**	**YES**	-Reviewed literature and diabetes self-management apps -No current app incorporates all essential features, highlighting an opportunity to develop a comprehensive diabetes management app. -five primary features: blood glucose monitoring, medication management, diet planning, physical activity tracking, automated data transfer. -seven secondary features: SMS notifications, weight management, communication tools, etc.	**Type:** a literature review and analysis of existing mobile applications for diabetes patient lifestyle management **Purpose of Data Collection:** to analyze articles and existing mobile apps in order to identify common features and opportunities for developing a comprehensive mobile application for diabetes patient self-management. **Collection Method:** Data collection was conducted through searches in journal databases for relevant articles and online app markets for mobile applications related to diabetes management. Keywords were used to search for articles and apps, and selection criteria were applied to filter and select relevant resources. **Target Stakeholders:**Diabetes patients who would benefit from a comprehensive mobile application for self-management of their condition	**Methodology:** a systematic review of literature and existing mobile applications. The authors searched for articles in journal databases and conducted searches in online app markets to identify relevant resources. Selection criteria were applied to filter and select articles and apps for analysis. **Data Analysis:** Reviewing the selected articles and mobile applications to identify common features and opportunities for developing a comprehensive mobile application for diabetes patient self-management. They compared features across different apps and summarized their findings in the results section of the review also provided insights and recommendations based on their analysis.	1.lack of integration of essential features for diabetes self-management in existing mobile applications especially tailored for populations in developing and least developed countries 2. the need for further evaluation and refinement of such applications.	Diet plan, exercise data, wegiht data, Blood pressure data , medication data , glucose monitor data	  Fig. 1. Comparison of prevalence of diabetes between Bangladesh and the world [4].
16. Development, Technical, and User Evaluation of a Web Mobile Application for Self-Control of Diabetes	**Telemedicine and e-Health**	https://www.liebertpub.com/doi/abs/10.1089/tmj.2015.0233	**liebertpub**	**NO**	-Diario Diabetes" is a web-based mobile app for easy diabetes monitoring anytime and anywhere with Internet access. -Developed using HTML, CSS, JavaScript, PHP, and MySQL. -The app can improve diabetes management, with all users recommending its use.	**Type:** a survey to evaluate the web mobile application for self-control of diabetes. **Purpose of Data Collection:** to evaluate the application on both a technical and user leve and to gather information on the loading times of the application and to assess its usability and usefulness from the perspective of the users. **Data Collection Method:** by conducting a survey with users who tried out the application. It gathered information on various aspects of the application, such as device usage, ease of use, usefulness of tasks, and whether users would recommend the app to others. **Target Stakeholders:** individuals with diabetes who would potentially use the web mobile application for self-control of their condition.	**Methodology:** developing the web mobile application using HTML, CSS, JavaScript, PHP, and MySQL technologies. Once developed, the application was evaluated both technically (measuring loading times) and on a user level through the survey. **Data Analysis:** A PHP based survey ware conducted with 150 initial user to assess the usability of this app while ensuring the application loading time were under two seconds using firebug	1. The need for studies on the app's impact on diabetic management, particularly measured by clinical outcomes such as HbA1c levels 2. Lack of integrating an automated insulin dosage calculator and a comprehensive dietary managemnet features		 Fig. 1. Flowchart.  Table 1. Some of the Applications Focus on Controlling Diabetes
17. Effectiveness of mHealth management with an implantable glucose sensor and a mobile application among Chinese adults with type 2 diabetes	**Journal of telemedicine and telecare**	https://journals.sagepub.com/doi/abs/10.1177/1357633X211020261	**Sagepub**	**YES**	- Evaluated mHealth management with implantable glucose sensor and app in Chinese T2DM patients. -68-patient trial: intervention group showed lower BMI, FBG, 2hPG, HbA1c, with improved quality of life and self-management. -Promising approach for T2DM management in China, with global implications.	**Type:** a randomized controlled trial (RCT). RCTs are considered the gold standard in research for evaluating the effectiveness of interventions because they allow researchers to assess causality by randomly assigning participants to different treatment groups. **Purpose of Data Collection**: to evaluate the effectiveness of mHealth management, specifically utilizing an implantable glucose sensor and a mobile application, among Chinese adults with type 2 diabetes mellitus (T2DM) and to collect data on various health indicators such as BMI, fasting blood glucose (FBG), postprandial two-hour blood glucose (2hPG), glycosylated haemoglobin (HbA1c), quality of life, and self-management ability to assess the impact of the intervention. **Data Collection Methods:** through various means, including participant questionnaires, health information inputted by patients into a mobile app, real-time blood glucose monitoring through an implantable sensor, and follow-up assessments by general practitioners (GPs). **Stakeholders:** patients between the ages of 18 and 75 who were awake, alert, responsive, and capable of independently completing questionnaires and operating the mobile app.	**Methodology:** a parallel-group, two-arm randomized controlled pilot trial design. Participants were randomly assigned to either the intervention group, which received mHealth management, or the control group, which received usual health management. This design allowed for the comparison of outcomes between the two groups after the intervention period. **Data Analysis:** The researchers analyzed the collected data using statistical methods using descriptive statistics to summarize demographic characteristics and outcome measures of both intervention and control groups. For comparing outcomes between groups, they likely used inferential statistics such as chi-square tests for categorical variables and independent samples t-tests for continuous variables. They also assessed the normality of data distribution before performing statistical tests. Finally, they interpreted the statistical significance of differences in outcomes between the intervention and control groups.	The lack of personalized health interventions in usual out-of-hospital T2DM management, the insufficient use of real-time blood glucose monitoring to adjust intervention plans, and the need for improved patient compliance through tailored mHealth solutions.	name, age, sex, height, weight, diabetes duration, fasting blood glucose (FBG), postprandial two-hour blood glucose (2hPG), glycosylated hemoglobin (HbA1c), physical function, mental health, social relations , diet, exercise, blood glucose monitoring, foot care, and smoking etc	 Figure 1. mHealth management model. T2DM: type 2 diabetes mellitus; app: application; GP: general practitioner; BMI: body mass index.
18. Web based prediction for diabetes treatment	**Future Generation Computer Systems**	https://www.sciencedirect.com/science/article/pii/S0167739X10001445	**Elsevier**	**NO**	-Web-based tool predicts future glycaemia, supports patients, doctors. -Conducts what-if analysis, suggests diet, treatment changes. -Integrates software engineering, Operation Research for interactive support.	**Type:** a study outlining the development of a web-based software tool for supporting diabetic patients and doctors in managing diabetes therapy and treatment. It combines software engineering techniques with Operation Research methods to create an interactive support system. **Purpose of Data Collection:** to diabetic patients' health information, including their glycaemia levels, dietary habits, insulin doses, clinical symptoms, and treatment outcomes and to support personalized therapy, perform predictions on future glycaemia levels, conduct what-if analysis, maintain electronic diaries, and provide information and suggestions to patients and doctors. **Data Collection Method:** No specific method of data collection. However it involve input from patients regarding their glycaemia levels, dietary habits, insulin dosage, and other relevant clinical information. **Target Stakeholders:** diabetic patients (both Type 1 and Type 2), doctors, and healthcare providers	**Methodology:** Specific techniques mentioned include the implementation of a web service application, classification algorithms (e.g., ID3 algorithm for classifying diabetic patients), and prediction methods (e.g., forecasting glycaemia levels using different trend types). The system also utilizes what-if analysis to simulate the impact of changes in clinical parameters on glycaemia levels. **Data Analysis:** Data analysis is conducted using various techniques integrated into the software tool. For example, classification algorithms are used to interpret symptoms and clinical values to determine whether a patient is diabetic and the type of diabetes. Prediction methods are employed to forecast glycaemia levels based on historical data and trends. Accuracy measures such as mean absolute deviation, mean absolute percentage deviation, and mean squared error are used to evaluate the performance of prediction methods. Additionally, the system provides statistical analysis capabilities for examining personal historical data or general data from the database to support decision-making by doctors and patients.	The need for further investigation into the optimization of diabetic treatment methods, the enhancement of accuracy in prediction models, and the exploration of more comprehensive what-if analysis scenarios.	age, weight, blood pressure, and glycaemia levels,Dietary information, patient's medical history etc.	 Fig. 7. Software architecture.  Fig. 4. Diet problem.  Fig. 2. Doctor. Fig. 3. Patient.
19.A systematic approach to enhance the explainability of artificial intelligence in healthcare with application to diagnosis of diabetes	**Healthcare Analytics**	https://www.sciencedirect.com/science/article/pii/S2772442523000503	**Elsevier**	**YES**	-Propose a systematic approach to enhance the explainability of AI applications in healthcare, specifically for type 2 diabetes diagnosis. -used diverse XAI tools, including approximating artificial neural networks to simpler CART models using LIME, to improve interpretability. -provided actionable health recommendations, demonstrating improved explainability and practical application in healthcare AI.	**Type :** Enhancing the explainability of AI applications in healthcare, particularly in the diagnosis of type 2 diabetes **Purpose of data collection:** Applying various explainable artificial intelligence (XAI) tools and techniques across different parts of the AI application process. **How the data was collected :** simulated data for 100 users and also generated synthetic data to enhance the dataset used for training and testing their AI models. **Stakeholders:** Patients,Healthcare,Regulators,Developers	**Methodology:** Seven XAI tools—smart technologies, common expression, color management, LIME, CART, donut charts, and GUIs—are applied to enhance AI explainability throughout input, processing, and output stages. These techniques simplify user interaction, replace technical jargon, visually differentiate elements, approximate complex models, generate understandable decision rules, and present results appealingly. **Data Analysis:** An ANN was trained using the Levenberg–Marquardt algorithm to predict diabetes probabilities, with LIME applied to approximate it with a CART model using synthetic data. Performance was evaluated, showing accuracies of 92% (ANN), 88% (CART), and 76% (MLR). Visualizations like donut charts and GUI-based recommendations were used to enhance user understanding and interpretation.	There is a need for XAI tools tailored to specific AI applications in healthcare and for different stakeholders, highlighting differences between healthcare and other domains.	Simulated data of 100 users, which included attributes such as age, physical activities, weeks pregnant, diabetes history in the family, body mass index, skin fold thickness, cholesterol levels, diastolic blood pressure, 2-hour serum insulin, pedigree of diabetes, and plasma glucose concentration.	 Fig. 1. XAI goals supported by the new techniques.  Fig. 6. Procedure of LIME for enhancing the explainability of an ANN/DNN for diabetes diagnosis. **Table 2** Existing AI technologies for diabetes analysis and related XAI tools and techniques. Existing AI technologies for diabetes analysis: • AdaBoost • ANN • Decision rules, decision support system • XGBoost • GBDT • kNN • NB • Random forest • SVM Related XAI tools and methods: • Box-and-whisker plot • Expert evaluation • Flow chart • Line chart • Inputs/outputs • Ontology • Overall performance: Accuracy, relevance, appropriateness, sensitivity, specificity, PPV, NPV, AUC, successful recommendation rate, % agreement, % disagreement, % additional, % not comparable • RSM • ROC curve • System architecture diagram • System snapshot • Textual description • Use cases, individual application • User interface 
20. Artificial intelligence in diabetes management: Advancements, opportunities, and challenges	**Cell Reports Medicine**	https://www.cell.com/cell-reports-medicine/pdf/S2666-3791(23)00380-4.pdf	**CellPress**	**Yes**	-AI's role in diabetes management. -Reviewing progress and challenges. -Creating AI-driven healthcare ecosystem.	**Type :** a review article summarizing the challenges and opportunities of applying artificial intelligence (AI) in diabetes management. **Purpose of data collection:** to review existing literature and studies to identify challenges and opportunities in applying AI to diabetes management and to understand the potential benefits of AI in addressing issues such as data quality control, technology design, clinical integration, privacy concerns, non-adherence, and legal regulations. **How the data was collected :** from existing literature, including research articles, clinical trials, and expert opinions in the field of AI and diabetes management. **Stakeholders:** healthcare professionals, researchers, policymakers, and stakeholders involved in diabetes management and AI technology development	**Methodology:** a comprehensive review of existing literature and studies related to AI applications in diabetes management and analyzing the challenges and opportunities identified in these studies to provide insights into the future of AI in diabetes care. **Data Analysis:** synthesizing information from various sources, identifying common themes, and summarizing key findings related to challenges and opportunities in applying AI to diabetes management. The authors provided recommendations and future directions based on their analysis of the collected data.	lack of clinical integration, and non-adherence, can be addressed in a database management system project by implementing robust data validation processes, seamless integration with clinical workflows, and features to promote user engagement and adherence.	incorporate data from previous research studies	     
21. An artificial intelligence diabetes management architecture based on 5G	**Digital Communications and Networks**	https://www.sciencedirect.com/science/article/pii/S2352864822001791	**Elsevier**	**YES**	- 5G-based Artificial Intelligence Diabetes Management (AIDM) architecture to enhance the efficiency of diabetes management for both acute and chronic complications. -Five-layer architecture for diabetes management. -Improves efficiency and screening rate.	**Type :** a simulation-based evaluation and optimization of an artificial intelligence diabetes management system (AIDM) for smart hospital environments using real-world hospital data. **Data collection purpose :** **How they collected the data :** There was no explicit mention of surveys or field studies, but simulations were conducted based on a real-world hospital ward scenario ,focusing on parameters relevant to diabetes management. **stakeholders :** patients with diabetes, healthcare providers, and potentially elderly patients requiring continuous monitoring of health parameters.	**Methodology :** optimizing the Random Access (RA) procedure in the transmission layer using a delay-aware approach. Additionally, a deep forest algorithm (gcForest) is applied in the application layer for diabetes prediction. The system utilizes a multi-grained cascade forest structure to handle small-scale training data effectively, suitable for edge computing scenarios common in healthcare settings. **Data analysis :** by removing irrelevant data, transforming categorical features using one-hot encoding, and standardizing the data. Principal Component Analysis (PCA) is used for feature selection. The performance of the gcForest algorithm is compared to other models (Decision Trees, Support Vector Machines, and Artificial Neural Networks) using metrics such as F1 score and precision, evaluated through 10-fold cross-validation. The results demonstrate the superiority of gcForest in accuracy and training efficiency for diabetes prediction in the proposed AIDM system.	The study relies on a single real-world health examination dataset from a specific hospital in Jiangsu province. This limited dataset may not fully represent the diversity of patient populations or sensor environments, potentially impacting the generalizability of the findings.	Dataset obtained from a Jiangsu province hospital. The dataset was processed to remove irrelevant data such as cardiogram data and follow-up data to reduce computing resources. The dataset contained information from 1521 individuals categorized into normal and diabetic groups.	 Fig. 2. The random access procedure in the cellular network.  Fig. 1. An artificial intelligence diabetes management architecture based on 5G.
22. Type 1 diabetes self-management: developing a web-based telemedicine application	**Health information management journal**	https://journals.sagepub.com/doi/abs/10.1177/1833358316639456	**Sage Publications**	**No**	-a web-based application for self-management of type 1 diabetes, catering to patients, carers, and physicians. -patients to input daily blood glucose levels, insulin doses, and activities, while physicians can remotely monitor patients' health status. -User satisfaction and accessibility	**Type:** A mixed-methods research involving both survey study and usability testing in a clinical setting. **Purpose:** To develop a web-based system for self-management of type 1 diabetes. **Data Collection:** To determine the information needs of the users, a questionnaire called 'Information Needs Assessment Questionnaire-INAQ' was designed. **Target:** Patients with type 1 diabetes, their parents, and physicians involved in their care.	**Methodology:** The methodology has of two main phases. Initially, a survey study was undertaken to determine what kind of information and capabilities are required by the users of the application. In the second phase, the application was developed based on the results derived from the first phase, and the initial usability testing was conducted. The setting of the research was the endocrine clinic in a teaching hospital. **Data Analysis:** Survey data were analyzed to identify data elements and system capabilities deemed necessary by at least 60% of participants. Usability testing results were analyzed based on mean values obtained from the standard questionnaire, indicating users' satisfaction and perceived usability across different assessment areas.	1. The number of patients and physicians recruited in the study was limited. 2. Due to the time and resource constraints, the researchers focused on providing a system specifically for patients with type 1 diabetes. so it not may effective for patients with type 2 diabetes	patients' demographic information, clinical parameters (such as blood glucose levels, insulin dosage, and activity levels)	 Figure 1. The research flow diagram.
23. A Diabetes Monitoring System and Health-Medical Service Composition Model in Cloud Environment		https://ieeexplore.ieee.org/document/10075459	**IEEE**	**YES**	-Automated eHealth cloud system -Extreme Learning Machine (ELM) -Improves diabetes detection	**Type:** a computational research project focusing on developing an automated diabetes prediction model using Extreme Learning Machine (ELM) algorithm. **Data collection purpose :** to develop an automated diabetes prediction model. Specifically, the researchers aimed to utilize the collected data to train and validate the Extreme Learning Machine (ELM) algorithm for early detection of diabetes. **How the data was collected :** collected data from the PIMA dataset, which was normalized and included features such as Glucose, Insulin, Age, BMI, and Diabetes Pedigree Function. **Stakeholders :** individuals at risk of diabetes, healthcare providers, and medical service providers.	**Methodology :** Employed Extreme Learning Machine (ELM) algorithm for classification tasks and Principal Component Analysis (PCA) for feature selection. Comparative analysis conducted with traditional machine learning classifiers like K-nearest neighbors, Naïve Bayes, Perceptron network, Support Vector Machine, etc. **Data analysis :** Evaluating the performance of the ELM model using metrics such as sensitivity, specificity, accuracy, and F1 score. Comparative analysis was conducted with traditional machine learning classifiers, and the effectiveness of the ELM model was assessed in both standalone and cloud computing environments.	Gap :	The PIMA Indians Diabetes Dataset which is commonly employed in diabetes research and contains information collected by the National Institute of Diabetes and Digestive and Kidney Diseases	**Algorithm 1** Feature Normalization **Input**: FMa [1: T, 1: F]: Feature matrix (T: total number of patients, F: total number of features) **Output:** NM [1: T, 1: F]: Normalized feature matrix function mean() and std() evaluated the mean and standard deviation of features. 1. Construct a blank matrix NM [1: T, 1: F] and two blanks vectors BV [1, 1: F] and SDM [1,1: F] 2. BV [1,1: F] ←mean (FMa) 3. SDM [1,1: F] ←std (FMa) 4. for i←1 to F do 5. NM [1: T, i] ← (FMa [1: T, i)- BV[1, i])/SDM[1, i] 6. end for  FIGURE 7. Diagrammatic display of the several machine learning models compared in a standalone environment.  FIGURE 1. Block diagram of the experimental model for the Extreme Learning Machine (ELM) based Cloud environment System. 

Diabetes Care Reimagined: An Integrated System for Real-time Monitoring, Dietary Management, and Personalized Healthcare										
Paper Identity	**Journal/ Conference**	**Paper Link**	**Publisher**	**Download Status**	**What**	**How**	**Result**	**Gaps**	**Datasets used**	**Diagram**
24. Development and Evaluation of a Mobile Personalized Blood Glucose Prediction System for Patients With Gestational Diabetes Mellitus	**JMIR mHealth and uHealth**	https://mhealth.jmir.org/2018/1/e6/	**JMIR Publication**	**YES**	-Development of infrastructure for personalized blood glucose (BG) prediction in gestational diabetes mellitus (GDM) patients -a mobile app for electronic diary management and continuous BG signal processing software -Tuning and evaluation of BG prediction models, including dynamic coefficients tuning -Clinical study involving 62 participants (49 with GDM, 13 controls) to validate the system	**Type :** An in-field data collection and observational study aimed at developing and validating predictive models for postprandial glucose (PPG) response in pregnant women. **Data collection Purpose:** To collect data on food intake and corresponding PPG curves to develop predictive models that can be integrated into a mobile app for personalized management of blood glucose levels in pregnant women. **How data was collected:** Data was collected from 62 pregnant women using a mobile app. **Target stakeholders :** Pregnant women, particularly those with gestational diabetes mellitus (GDM) .	**Methodology :** They integrate data Combining CGM data with electronic diary entries.Models predicting PPG response were developed using characteristics such as HbA1c, BMI, age, lifestyle parameters, and specific meal data.These models were implemented in a mobile app that provides personalized dietary advice to manage blood glucose levels. **Data analysis :** The development of linear regression models to predict postprandial glucose responses. Key predictors included pre-meal BG levels, carbohydrate intake, meal type, 2-hour BG levels from OGTT, coffee consumption, and physical activity during pregnancy. Evaluation metrics such as R, RMSE, MAE, and MAPE were used to assess model performance, demonstrating adequate predictive accuracy for real-life meals.	1. Risk of Including potential biases in self-reported food intake data and the reliance on a relatively small sample size for developing postprandial glucose response prediction models. 2. The app's current availability limited to Android devices and PCs excludes iPhone users, and there are plans to expand platform compatibility. 3.Insulin treatment was not included in the study. 4. Other limitations include the lack of wireless BG reading upload capability, semi-automatic data processing, and the models' validation only for women in the third trimester of pregnancy.	The data on 909 food intakes and corresponding postprandial BG curves as well as the set of patients' characteristics (eg, glycated hemoglobin, body mass index [BMI], age, and lifestyle parameters) were selected as inputs for the BG prediction models. Food intake data ; Information on the type and quantity of food consumed, including macronutrients (e.g., carbohydrates, proteins, fats), micronutrients, and other nutritional components. Demographic information such as age, BMI, and HbA1c levels, as well as lifestyle parameters like physical activity levels, coffee consumption, and dietary habits. Data on blood glucose level measured after meal . The app includes a food database created based on reference books of the Russian Academy of Medical Sciences and the US Department of Agriculture (USDA) Food Composition Databases	
25. Mobile Health Applications to Assist Patients with Diabetes: Lessons Learned and Design Implications	**Journal of diabetes science and technology**	https://journals.sagepub.com/doi/abs/10.1177/1932296812000525	**Sage Publications**	**YES**	-Introduction of Few Touch Application (FTA) for diabetes self-management -Overview of 10 FTA-based apps: BG data transfer, SMS education, diabetes diaries, healthcare integration, food picture diary, activity monitoring, nutrition info, context sensitivity, BG modeling -Performance analysis and lessons learned for mHealth app design	This study focuses on FTAs, or few touch applications, which help diabetic patients to self manage . The FTA offers individualized decision support with the use of a phone-based diabetes diary. FTA is designed via automatic BG data sharing via Bluetooth and SMS-based education. Ten FTA-based apps were analyzed, and the results show that these tools can improve diabetic care for both type 1 and type 2 diabetes by facilitating communication, motivating users, and integrating with healthcare professionals.	**Design process:** 1.Integrating relevant technology enabling smooth incorporation into daily life, such as Bluetooth and mobile phones. 2.Emphasizing the importance of crucial self-management factors including dietary habits, physical activity, blood pressure monitoring, and medication administration. 3. PHA optimization for application **Evaluation process:** 1.User-centered techniques 2. Questionnaires, usability testing, interviews, and prototypes. 3.The applications are refined through iterative design and development cycles that take user feedback and usability testing into account.	Touch-sensitive interface usability issues, particularly for elderly or skillfully challenged users;The preferred choices of consumers are limited while using a single mobile device.; Trouble finding users for the patient group		
26. A remote healthcare monitoring framework for diabetes prediction using machine learning	**Healthcare Technology Letters**	https://ietresearch.onlinelibrary.wiley.com/doi/abs/10.1049/htl2.12010	**Wiley Online Library**	**YES**	-Proposed an end-to-end remote monitoring framework for automated diabetes risk prediction and management using personal health devices, smart wearables, and smartphones. -SVM model achieves 83.20% prediction accuracy.	**Type:** A framework that uses various machine learning algorithms to automate diabetes detection at an early stage and alerts medical professionals for timely intervention. **Data collection purpose:** Collect and analyze patient data, aiming to improve diabetes management through real-time monitoring and predictive analytics. **Data collection method:** The PIMA Indian Diabetes Database used as the dataset for this study.There are 768 patients in the dataset, with nine feature attributes for each patient. **Target stakeholders:** Diabetes patients, Healthcare providers	**Methodology:** RPM framework is used for live machine learning models to predict diabetes and suggest interventions. It gathers data from devices like smartwatches and smartphones and sends it to a cloud server. Machine learning models, including decision trees and neural networks,SVM and KNN are then used. **Data analysis:** Users input their profile information, and iHealth devices actively gather health metrics like glucose levels and blood pressure, while smartwatches and smartphones passively track steps and activity. Age, gender, height, and weight, are used by the server to calculate the derived metrics.	Lack of additional devices and patient information.	The dataset used in this work is the PIMA Indian Diabetes Database accessed from the University of California, Irvine ML repository [21]. The dataset has a sample size of n = 768 patients, each patient with nine feature attributes. The patients are all females between the ages of 21 to 81 and their data was collected by the National Institute of Diabetes, Digestive and Kidney Diseases.	 
27.Validation of the effectiveness of a digital integrated healthcare platform utilizing an AI-based dietary management solution	**BMC Medical Informatics and Decision Making**	https://link.springer.com/article/10.1186/s12911-020-01179-x	**Springer**	**YES**	-AI dietary management and CGMS integration -Randomized trial with three patient groups -Primary endpoint: change in HbA1c levels -Medical staff provide monitoring and feedback	**Type:** AI-based continuous glucose monitoring (CGMS) and dietary control for individuals with type 2 diabetes (T2DM). **Data Collection purpose:**Integrate health data into the digital integrated healthcare platform to effectively manage patients with type 2 diabetic mellitus (T2DM). **Data Collection Method:** The platform collected data on glucose levels from the glucometer, body BMI, body fat mass, blood pressure, number of steps, burned calories, walking distance, and intake calories through various devices linked to the platform **Target Stakeholders:** Patients with type 2 diabetes mellitus. Medical staff involved in monitoring and intervention	**Methodology:**48-week, open-label, randomized, multicenter trial for patients with type 2 diabetes, with three groups. Digital integrated healthcare platform utilizes an AI-based dietary management solution and a continuous glucose monitoring system to collect data and provide feedback to patients. **Data Analysis:** The primary outcome is the change in HbA1c values from baseline to six months. Secondary outcomes include HbA1c and fasting blood glucose levels at various intervals (weeks 12, 24, 36, and 48), lipid profiles at weeks 24 and 48.	Manual entry of blood glucose values measured by a home glucometer into apps leads to typographical errors in glucose records.		
28. Personalized Type 2 Diabetes Management Using a Mobile Application Integrated with Electronic Medical Records	**International**	https://www.mdpi.com/1660-4601/18/10/5300	**MDPI**	**YES**	-Personalized mobile app for T2DM management -Three groups: regular care, app, app+feedback -26-week intervention, 26-week observation -Evaluating clinical utility and efficacy	**Type:** Evaluation of personalized lifestyle intervention efficacy in T2DM participants and compares mobile app vs. regular care for T2DM management. **Data collection Purpose:** Evaluating the utility, clinical efficacy, and cost effectiveness of a personalized diabetes management system using an EMR-integrated mobile application in participants with type 2 diabetes **Data collection Method:** Data collected from 282 participants with type 2 diabetes, who are split into three groups. Demographic, clinical, and lifestyle information collected at the baseline, repeated at week 26 and week 52. **Target Stakeholders:** Healthcare professionals, Participants with type 2 diabetes participated in the ongoing randomized controlled trial.	**Methodology:** An open-label parallel-group randomized controlled trial with 282 people with T2DM. Participants are divided into one of three groups: regular care, mobile diabetes management, or mobile diabetes management with individualized HCP feedback. The primary endpoint is the decrease in HbA1c at week 26, whereas secondary outcomes include lifestyle modifications, cardiometabolic risk factors, and quality of life. **Data Analysis:** The change in HbA1c from baseline to week 26 as the primary outcome. Secondary outcomes include changes in HbA1c and fasting glucose from week 26 to week 52. Data managed through electronic case report forms in password-protected databases.	Not mentioned	Existing datasets	 
29.Machine Learning Implementation of a Diabetic Patient Monitoring System Using Interactive E-App	**Computational 2021**	https://www.hindawi.com/journals/cin/2021/5759184/	**Hindawi**	**YES**	- Proposes deep learning model - Predicts miRNA-disease associations - Utilizes autoencoders - Incorporates convolutional neural networks	**Type:** A study that looks at new ways for treating type 1 diabetes that combine artificial intelligence and continuous glucose monitoring devices to improve decision making. Personalized insulin bolus calculation, adaptive tweaking of bolus calculator parameters, and glucose prediction utilizing artificial intelligence approaches **Data Collection Method:** Patients with type 1 diabetes (T1D) record glucose levels, insulin administrations, meal intakes, and physical activity. Wearable continuous glucose monitoring (CGM) sensors deliver real-time blood glucose concentration and rate-of-change data every 1-5 minutes. **Data Collection Purpose:** Developing decision support systems for patient use that automatically evaluate data gathered by continuous glucose monitoring (CGM) sensors and other portable devices and provide patients with individualized suggestions for therapy changes. **Target Stakeholders:** Patients with type 1 diabetes and healthcare practitioners participating in treatment.	**Methodology :**It uses a Neural network for insulin bolus calculation using CGM information. It reviews state-of-the-art methodologies utilizing AI and CGM sensors for decision support in advanced T1D management, including personalized insulin bolus calculation, adaptive tuning of bolus calculator parameters, and glucose prediction. **Data Analysis:** The analysis includes methodologies for personalized insulin bolus calculation, adaptive tuning of bolus calculator parameters, and glucose prediction using the data collected from patients with type 1 diabetes.	Properly integrating and maintaining various data types for diabetes control.	Doesn't mention any specific datasets used in the study.	
30. Artificial Intelligence: The Future for Diabetes Care	**Journal**	https://www.sciencedirect.com/science/article/abs/pii/S0002934320303399	**Elsevier**	**YES**	- Explores intermittent fasting (IF) - Investigates metabolism and weight loss	**Type:** The paper explores the transformative impact of artificial intelligence (AI) in diabetes care, focusing on prevention, diagnosis, and treatment. **Data collection purpose:** To support predictive models for the risk of developing diabetes or its consequent complications, as well as to build algorithms for the management of diabetes. **Data collection method:** Existing literature, studies, and clinical trials related to artificial intelligence applications in diabetes care **Target stakeholders:** Patients with diabetes, Healthcare professionals.	**Methodology:** Machine learning processes like support vector machines have been utilized to build digital support in diabetes care.Genomics, molecular phenotyping, epigenetic alterations, and digital biomarkers are used. **Data Analysis:** The use of various machine learning techniques such as decision tree, random forest, classification and regression trees, and k-nearest neighbor for automated screening of blood glucose variability	Ai in itself requires periodic refinements by experts;Limitations of data	Data from 68,994 healthy people and patients with diabetes has been used as a training data set for using decision tree, random forest, and neural networks to predict diabetes with high accuracy (accuracy = 0.8084 with all attributes).	
31.Efficacy of Personalized Diabetes Self-care Using an Electronic Medical Record–Integrated Mobile App in Patients With Type 2 Diabetes: 6-Month Randomized Controlled Trial	**Journal**	https://www.jmir.org/2022/7/e37430/	**JMIR Publications**	**YES**	- Focuses on mHealth interventions - Evaluates effectiveness - Targets medication adherence - Utilizes smartphone apps	**Type:** Glycemic control in patients with type 2 diabetes. **Purpose of data:** Assess effect of EMR-integrated app on personalized diabetes self-care. Evaluate glycemic control in patients with type 2 diabetes mellitus. **Data collection method:** Data taken from users . Also used Open VC dataset. **Target stakeholders:** -Patients with type 2 diabetes mellitus -Healthcare providers -App developers -Researchers in diabetes management	**Methodology:** Random assignment to 3 groups with stratification by institution and HbA1c level.Use of glucometer with automatic data transfer for self-monitoring. **Data analysis:** Demographic data taken from users. Assess effect of EMR-integrated app on personalized diabetes self-care. Evaluate glycemic control in patients with type 2 diabetes mellitus.	Limited data on long-term follow-up for mobile health interventions. Unclear effectiveness of apps in diabetes self-care interventions.	The OpenVC dataset was utilized to train and enhance the model.	Demographic Data  Diagnosis data  3 Option used in app for treatment  Feedback Taken From users 
32.Remote Health Consultations Supported by a Diabetes Management Web Application With a New Glucose Meter Demonstrates Improved Glycemic Control	**Journal**	https://journals.sagepub.com/doi/full/10.1177/1932296815622646	**Sage Publications.**	**YES**	- Investigates use of mHealth for diabetes management - Explores impact on self-management behaviors - Utilizes smartphone applications - Targets underserved populations	**Type:** Remote health consultations improve diabetes management and glycemic control. Mobile technologies enhance patient-HCP communication, leading to better outcomes. **Data collection method:** clinical data collected from patients with T1DM and T2DM who uploaded blood glucose meter results to the OneTouch Reveal (OTR) web application for 12 weeks. **Target stakeholders:** Patients with T1DM and T2DM Healthcare professionals (HCPs) Diabetes specialist nurses	**Methodology:** Single arm study at NHS clinics in Scotland with ethics. approval.Subjects aged 18-70 with T1DM or T2DM, self-monitoring blood glucose. OTV meter with color range indicator, OTR web application for monitoring.Telephone consultations at 4 and 8 weeks, final HbA1c determination. OTR and OTV algorithms for identifying low and high glucose patterns. **Data analysis:** Data analyzed using Pearson correlation coefficient for significant results. Minitab 16.1.1 software utilized for all data analyses. Also the data variables included age, duration of self-monitoring of blood glucose (SMBG), insulin therapy details, HbA1c levels and prior experience with mobile technology/software	A few data research on HCP feedback necessity for diabetes management success. Lack of studies on long-term impact of remote health consultations	The dataset used is related to clinical data collected from patients with T1DM and T2DM who uploaded blood glucose meter results to the OneTouch Reveal (OTR) web application for 12 weeks. The variable will be shown in the picture...	Demographic Data  
33.Design and Development of a Mobile-Based Self-Care Application for Patients with Type 2 Diabetes	**Journal**	https://journals.sagepub.com/doi/full/10.1177/19322968211007124	**Sage Publications.**	**YES**	-Examines mobile health (mHealth) platform -Focuses on enhancing patient self-efficacy -Targets behavioral changes -Utilizes cloud-based services and mobile apps	**Type:** Aimed to improve diabetes management through innovative mobile technology. **Purpose of data:** Design and development of T2DM self-care app using JAVA programming Data collection: **Target stakeholders:** Patients with T2DM Healthcare providers App developers Researchers in diabetes care	**Methodology:** Studied digital markets to identify key features and capabilities. **Data analysis:** Content analysis on 32 apps extracted 18 features for T2DM app.	Identifying essential features for T2DM self-care apps. Lack of tailored apps for different types of diabetes.	The OpenVC dataset was utilized to train and enhance the model.	 Table 2. Development of SG and BP for Patients and Volunteers in the PHP Group

Diabetes Care Reimagined: An Integrated System for Real-time Monitoring, Dietary Management, and Personalized Healthcare

Paper Identity	Journal/ Conference	Paper Link	Publisher	Download Status	What	How	Result	Gaps	Datasets used	Diagram
34.Novel App- and Web-Supported Diabetes Prevention Program to Promote Weight Reduction, Physical Activity, and a Healthier Lifestyle: Observation of the Clinical Application	**Journal**	https://journals.sagepub.com/doi/full/10.1177/1932296818768621	**Sage Publications.**	**YES**	-Investigates effectiveness of mHealth interventions -Targets diabetes self-management -Utilizes mobile health platforms -Focuses on enhancing patient self-efficacy	**Type:** Novel digital program for diabetes prevention and weight reduction. **Purpose of data:** Observational study on personalized health management in metabolic syndrome patients.Comparison of weight reduction programs in 23 German practices. **Data collection:** **Target stakeholders:** Healthcare providers Patients with metabolic syndrome Individuals at risk of T2DM	**Methodology:** Comparison of PHM and UC groups for weight-related parameters. Analysis of time in study and weight measurements for comparison. **Data analysis:** comparing the personalized health management (PHM) group with the usual care (UC) group. Kaplan-Meier Estimates Cox Proportional Hazard Model Logistic Regression	Lack of recorded reasons for program discontinuation.	The dataset used in includes data from 166 patients with metabolic syndrome. The data was acquired using the Accu-Chek View app and a web-based portal	Demographic data from both side uc and phm
35.Implementation of a Web Application to Predict Diabetes Disease: An Approach Using Machine Learning Algorithm	**Conference**	https://ieeexplore.ieee.org/abstract/document/8631968	**IEEE**	**YES**	-Investigates big data analytics for healthcare -Focuses on predictive modeling -Utilizes machine learning techniques -Targets cardiovascular disease risk assessment	**Type:** Web app predicts diabetes using machine learning with 82.35% accuracy. **Purpose of data:** To predict diabetes disease. **Data collection:** They used preexisting Pima Indian dataset for diabetes onset prediction. **Target stakeholders:**	**Methodology:** Paper predicts diabetes using machine learning algorithms with high accuracy. Focuses on developing a web application for diabetes prediction. **Data analysis:** Discusses KNN, Naive Bayes, and ANN in diabetes prediction. Supervised Learning algorithms used here.. (Supervised Learning algorithms learn the pattern from pre-existing data and try to predict new result based on the previous learning)	Lack of comparison with diverse machine learning algorithms. Absence of detailed analysis on the impact of data preprocessing techniques.	Pre existing data Pima Indian dataset, which is capable of predicting the onset of diabetes based on diagnostics manner The dataset consists of features such as the number of times pregnant, glucose test results, blood pressure, triceps skinfold thickness, 2-hour serum insulin levels, body mass index, diabetes pedigree function, and age	Dataset 
36.Enhanced Patient Self-efficacy and Behavioral Changes: Cloud-based mHealth Platform and Mobile App Service	**Conference**	https://www.researchgate.net/publication/332160690_Enhanced_Patient_Self-efficacy_and_Behavioral_Changes_Cloud-based_mHealth_Platform_and_Mobile_App_Service_Preprint	**IEEE**	**YES**	- Explores cloud-based mHealth platform - Focuses on enhancing patient self-efficacy - Targets behavioral changes - Utilizes mobile app services - Preprint hosted on ResearchGate	**Type:** Study on diabetes self-management using mobile app interventions and compliance. **Purpose of data:** Data collected for patient self-efficacy and health promotion behaviors.Patient preferences in health promotion program and mobile self-management education. Personalized health interventions to improve self-management and self-efficacy. **Target stakeholders:** Patients with type 2 diabetes Health educators Physicians Nutritionists Care managers	**Methodology:** Pre- and post intervention assessments conducted via mobile app. **Data analysis:** Three-dimensional triaxial data analysis tool used for patient health status. Patient data aggregated based on disease type, symptoms severity and factors. Application programming interface engine utilized for health status aggregation.	Lack of research on low motivation patients with diabetes. Need for effective adherence management techniques in diabetes interventions.	The dataset used included data from the electronic health database with a total of 3128 patients with diabetes.. Data variables collected included information on patients' health status, lifestyle, behavior changes, treatment preferences, blood pressure, body mass index, glycated hemoglobin levels, and self-care knowledge assessment involved using a mobile app for interactive patient assessment, iPad for data collection, and a cloud-based IPMF platform to store patient feedback	
37 Mobile Applications for Diabetes Self-Management Status and Potential	**Journal**	https://journals.sagepub.com/doi/full/10.1177/1932296813070130	**Sage Publications.**	**YES**	- Investigates the use of a personal health library-enabled mHealth recommender system - Focuses on self-management of diabetes - Utilizes knowledge graphs and linked data - Targets underserved populations	**Type:** **Data Collection Purpose:** The purpose was to evaluate the effectiveness and feasibility of mobile applications in supporting diabetes self-management. **Data Collection Method:** Data was collected through various methods including surveys, interviews, usability studies, and clinical trials involving mobile applications for diabetes management. **Target Stakeholders:** The primary stakeholders targeted were: - Patients with diabetes (both Type 1 and Type 2) - Healthcare providers (clinicians, diabetes educators) - Young adults and adults with diabetes	**Methodology:** The methodologies used included: - Qualitative and quantitative evaluations - Randomized controlled trials (RCTs) - Feasibility and usability studies **Data Analysis:** Data analysis methods included: - Statistical analysis of clinical and behavioral outcomes - Qualitative analysis of patient and provider feedback - Comparative analysis of intervention and control groups in trials	1. Effectiveness evaluation in real-world settings. 2. Scalability and sustainability considerations. 3. User engagement and satisfaction assessment. 4. Privacy and security concerns exploration. 5. Comparison with existing interventions or technologies.		
38. Mobile applications for control and self management of diabetes: a systematic review	**Journal**	https://link.springer.com/article/10.1007/s10916-016-0564-8?wt	**Springer**	**YES**	- Explores the use of mobile health (mHealth) technology - Focuses on medication adherence in chronic diseases - Utilizes smartphone applications - Targets improving patient outcomes	**Type:** Reviews various studies and systematic reviews on mobile applications for diabetes self-management, including surveys and in-field studies. **Purpose of Data Collection:** To assess the effectiveness, usability, and potential benefits of mobile applications in managing diabetes, improving glycemic control, and supporting patient self-management practices. **Data Collection Method:** Data was collected through randomized controlled trials, qualitative evaluations, and pilot studies. Methods included mobile phone telemonitoring systems, self-reported data via mobile apps, and PDA-assisted interventions. **Target Stakeholders:** Type 1 and type 2 diabetes, young adults, and patients with cardiovascular diseases alongside diabetes. Specific focus groups also included patients who might benefit from personalized behavioral interventions and lifestyle changes.	**Methodology:** The methodologies used varied across studies but predominantly included randomized controlled trials (RCTs), pilot studies, feasibility studies, and mixed-methods approaches. Data collection involved electronic diaries, situational feedback via smartphones, and mobile phone-based self-management tools. **Data Analysis:** statistical analysis of glycemic control metrics, qualitative assessments of user experiences and satisfaction, and systematic reviews. Specific studies also analyzed clinical and behavioral outcomes through structured questionnaires and telemonitoring data	1. Limited exploration of factors influencing adherence. 2. Insufficient analysis of technology usability among older adults. 3. Lack of consideration for long-term adherence sustainability. 4. Inadequate assessment of user experience and satisfaction. 5. Absence of comparison with traditional exercise programs' adherence rates.		
39.A Personalized Recommendation System to Support Diabetes Self-Management for American Indiansv	**Conference**	https://ieeexplore.ieee.org/abstract/document/8539994	**IEEE**	**YES**	- Investigates personalized medication adherence monitoring - Utilizes smartphone-based sensors - Focuses on patients with mental health disorders - Targets improving treatment adherence	**purpose:** To develop a personalized diabetes recommendation system customized for American Indian (AI) and Alaska Native (AN) patients. The purpose was to address the specific socio-economic, cultural, ethnic, and geographical needs of these patients, considering their unique barriers such as poverty, lower health literacy, and limited access to healthcare services. **collected data process:** by integrating AI/AN users' profiles with general clinical diabetes guidelines. This approach ensured that the recommendations were tailored to be more useful and appropriate for the AI/AN users' context. **Stakeholders:** American Indian and Alaska Native patients with diabetes.	**Methodology:** designing a personalized recommendation system that respects the specific socio-economic, cultural, ethnic, and geographical conditions of the AI/AN patients. This system utilized machine learning-based, collaborative filtering-based, and rule-based algorithms to make wellness and lifestyle recommendations. **Data Analysis:** By applying machine learning algorithms, such as supervised learning for classifying users and providing personalized feedback, and Bayesian networks on multi-structured healthcare data. The analysis focused on making lifestyle recommendations based on the classification results and historical data of the users and similar profiles.	1. Limited exploration of factors influencing medication adherence. 2. Insufficient analysis of smartphone usability for medication adherence monitoring. 3. Lack of consideration for long-term sustainability of personalized monitoring approaches. 4. Inadequate assessment of user experience and satisfaction with the monitoring system. 5. Absence of comparison with traditional medication adherence monitoring methods.		
40. Efficacy of Mobile Apps to Support the Care of Patients With Diabetes Mellitus: A Systematic Review and Meta-Analysis of Randomized Controlled Trials	**Journal**	https://mhealth.jmir.org/2017/3/e4/	**JMIR Publications**	**YES**	- Explores the use of mobile health (mHealth) technology - Focuses on interventions for substance use disorders - Utilizes smartphone apps for treatment support - Targets improving patient outcomes and adherence	**Type:** A systematic review and meta-analysis of randomized controlled trials (RCTs) evaluating the efficacy of mobile apps in supporting the care of patients with diabetes mellitus (DM). **Purpose:** To evaluate the effectiveness of mobile health apps in assisting patients with DM in their treatment. This includes assessing biochemical parameters like HbA1c, blood glucose levels, cholesterol levels, weight, blood pressure, and quality of life indicators. **Data Collection:** Data was collected from studies identified through searches in electronic databases (MEDLINE, Cochrane CENTRAL, LILACS) and manual searches of references in relevant publications. Eligible studies were selected based on predefined inclusion criteria, focusing on RCTs conducted between 2008 and 2016 involving DM patients using mobile health apps. **Stakeholders:** patients with diabetes mellitus, both type 1 and type 2, including adults and children, with or without comorbidities.	**Methodology:** The systematic review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. This involved defining inclusion criteria using the PICOS framework (Participants, Interventions, Comparison, Outcomes, Study Design) and performing a comprehensive literature search. **Data Analysis:** The meta-analysis was conducted using Review Manager software version 5.3. The analysis focused on evaluating the mean difference in HbA1c levels between the intervention (mobile app use) and control groups. Statistical significance and heterogeneity were also assessed to determine the efficacy of the interventions.	1. Limited exploration of factors influencing mobile app adoption. 2. Insufficient analysis of app usability and engagement. 3. Lack of consideration for long-term effectiveness and sustainability. 4. Inadequate assessment of user experience and satisfaction. 5. Absence of comparison with traditional interventions' effectiveness.		
41. Using a Personal Health Library–Enabled mHealth Recommender System for Self-Management of Diabetes Among Underserved Populations Use Case for Knowledge Graphs and Linked Data	**Conference**	https://www.researchgate.net/publication/349574196_Using_a_Personal_Health_Library-Enabled_mHealth_Recommender_System_for_Self-Management_of_Diabetes_Among_Underserved_Populations_Use_Case_for_Knowledge_Graphs_and_Linked_Data	**Springer**	**YES**	- Investigates a personal health library-enabled mHealth recommender system - Focuses on self-management of diabetes - Utilizes knowledge graphs and linked data - Targets underserved populations	**Type:** Evaluation studies protocol for a mobile Health app implementation. **Purpose:** To improve care for people with obesity, diabetes, and related chronic conditions by utilizing a Personal Health Library (PHL)-enabled mHealth recommender system. **Data Collection:** - Historical data from regional registries (e.g., Diabetes Wellness and Prevention Coalition). - ODL data from mobile devices and activity trackers (e.g., physical exercises, heart rate). - Population-level Social Determinants of Health (SDoH) data (e.g., walkability scores). - Public knowledge from research articles, news, blogs, and social networks. **Stakeholders:** Underserved populations with obesity, diabetes, and related chronic conditions.	**Methodology:** - Utilized RESTful API for integrating data. - Employed Solid technology stack, RDFlib, LDflex for data manipulation and querying. - Two evaluation studies planned before full implementation. **Data Analysis:** Analysis will involve querying the patient's RDF-based PKG data model and utilizing SPARQL queries to integrate and interpret data across different sources	1. Limited evaluation of real-world effectiveness. 2. Inadequate exploration of scalability and sustainability. 3. Insufficient assessment of user satisfaction. 4. Lack of thorough examination of privacy and security concerns. 5. Need for comparison with existing interventions.		   
42. Adaptation of an Adult Web Application for Type 1 Diabetes Self-management to Youth Using the Behavior Change Wheel to Tailor the Needs of Health Care Transition: Qualitative Interview Study	**Journal**	https://diabetes.jmir.org/2023/1/e42564/	**JMIR Publications**	**YES**	- Investigates digital therapeutics for managing type 2 diabetes - Conducts a systematic review and meta-analysis - Evaluates effectiveness of digital interventions - Focuses on improving diabetes management outcomes	**Type:** Internet-based semi-structured individual interviews based on a phenomenological study design. **Purpose:** To identify the needs and factors influencing diabetes self-management (DSM) among youth living with type 1 diabetes (T1D) in the context of health care transition. This data was intended to inform the adaptation of an adult self-guided web application for youth DSM. **Data collection**: Data was collected through semi-structured individual interviews conducted online **Stakeholders:** Youths aged 14-24 years living with type 1 diabetes	**Method: A** qualitative phenomenological approach with internet-based semi-structured individual interviews. Concept mapping was employed in the data analysis. **Data Analysis:** Transcripts from the interviews were analyzed using an inductive approach with concept mapping to categorize factors influencing DSM into barriers and facilitators, and as external or internal.	1. Limited identification of specific factors contributing to digital therapeutics effectiveness. 2. Insufficient analysis of long-term sustainability. 3. Lack of consideration for demographic disparities in access and utilization. 4. Inadequate assessment of user engagement and adherence. 5. Need for comparative analysis with traditional diabetes management approaches.		

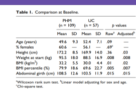
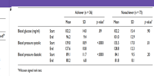


Table 1. Comparison at Baseline.

	PHM (n = 109)		UC (n = 57)		p values	
	Mean	SD	Mean	SD	Raw[a]	Adjusted[b]
Age (years)	49.6	9.3	52.4	7.1	.09	—
% females	60.6	—	56.1	—	.69[c]	—
Height (cm)	172.2	8.5	169.9	14.0	.36	.03
Weight at start (kg)	95.5	18.0	88.5	16.9	.008	.008
BMI (kg/m^2)	32.2	5.5	30.0	4.4	.01	.02
BMI percentile (%)	79.9	18.6	69.6	22.7	.005	.007
Abdominal girth (cm)	108.5	12.6	103.5	11.9	.015	.015

[a]Wilcoxon rank sum test. [b]Linear model adjusting for sex and age. [c]Chi-square test.



		Achiever (n = 36)			Nonachiever (n = 73)		
		Mean	SD	p value[a]	Mean	SD	p value[a]
Blood glucose (mg/ml)	Start	102.2	14.0	.09	103.2	15.4	.90
	End	96.2	9.4		101.0	12.9	
Blood pressure systolic	Start	139.8	18.9	<.0001	135.5	17.0	.01
	End	127.6	10.8		128.8	12.3	
Blood pressure diastolic	Start	89.1	11.7	<.0001	84.1	9.5	.20
	End	80.2	6.8		81.8	8.1	

[a]Wilcoxon signed rank test.

Author		Roll
Mohammed Tashfiq Islam	1-6	2221651
Mustaqueem Alam	7-12	2220769
Shahmaruf Siraj Mugdho	13-18	2220644
Anika Jasim Ema	19-24	2220661
Kazi Samin Nawal	25-30	2220256
Md.Jahidul Hossain Mekat	31-36	2221395
Md Shahduzzaman	37-42	2131297