Special journal of the Medical Academy and other Life Sciences
Vol. 3 No. 4 (2025)

Assessing the Impact of Virtual Health Counseling on Diabetes Management

Likha Nurhayati[1], Ghassan Salibi[2], Nikolaos Tzenios[3]

[1] Kursk State Medical. University

[123] Charisma University

Abstract

Background: Diabetes mellitus is a chronic, increasingly prevalent condition requiring continuous medical care and lifestyle management. Virtual health counselling has emerged as a promising digital solution to support diabetes management, particularly in underserved and remote regions. This study investigates how virtual counselling can enhance patient engagement, improve glycemic control, and foster adherence to treatment among patients with Type 2 diabetes.

Methods and Materials: This project employed a structured virtual health counselling intervention conducted over 10 weeks, targeting adults with Type 2 diabetes. The intervention included bi-weekly telemedicine sessions covering diet, exercise, medication adherence, and mental health. Pre- and post-intervention surveys, expert interviews, and clinical data (e.g., HbA1c levels) were used to assess patient knowledge, engagement, and health outcomes. A mixed-methods approach incorporated both quantitative health metrics and qualitative feedback from healthcare professionals and patients.

Results: The program achieved a 55% patient engagement rate. Survey responses revealed increased knowledge, confidence, and satisfaction with diabetes management post-intervention. Notably, 75% of participants showed improvements in blood glucose control, with average HbA1c reductions ranging from 5% to 12%. Despite some technological barriers and the need for more personalized care, the virtual counselling model proved effective in improving patient outcomes.

Conclusion: Virtual health counselling significantly supports diabetes management by enhancing patient engagement, promoting better glycemic control, and offering accessible, flexible healthcare. Integrating telehealth into diabetes care pathways may reduce complications and improve quality of life. Future initiatives should address technical limitations and personalize care to maximize impact.

Keywords: *Virtual health counselling, Diabetes management, Telemedicine, Patient engagement, Glycemic control*

Assessing the Impact of Virtual Health Counseling on Diabetes Management

Diabetes is a chronic disease that affects millions of people worldwide, with its prevalence steadily rising, particularly in low- and middle-income countries. The World Health Organization (WHO) estimates that over 422 million people live with diabetes, and this number is projected to increase in the coming years. Diabetes is associated with severe complications such as cardiovascular disease, kidney failure, and neuropathy, making effective management crucial for reducing morbidity and mortality. Despite advancements in treatment options, many patients struggle to achieve optimal glucose control, largely due to challenges like medication adherence, lifestyle changes, and continuous monitoring.

Telemedicine has become a transformative tool in healthcare, particularly for managing chronic conditions like diabetes. Virtual health counselling, a key telemedicine component, allows healthcare providers to reach patients remotely, offering consultations, education, and support without needing in-person visits. This is especially important for individuals in rural or underserved areas with limited access to specialized care. By integrating virtual counselling into diabetes management, patients can receive tailored medication, diet, exercise, and self-monitoring guidance, essential for effective blood glucose regulation and preventing complications.

This project aims to critically assess the impact of virtual health counselling on diabetes management by analyzing the effectiveness of virtual counselling sessions in improving diabetes control among patients. By evaluating existing virtual counselling programs, the study will focus on patient engagement, blood glucose regulation, and overall diabetes outcomes. The findings will provide valuable insights for improving diabetes management through digital health solutions.

Objectives and Purpose:

This project evaluates the role of virtual health counseling in enhancing diabetes management. By analyzing virtual counseling sessions, this study aims to assess their effectiveness in improving patient engagement, blood glucose regulation, and overall diabetes outcomes. The project will evaluate existing programs to identify key elements that contribute to virtual health interventions' success and offer healthcare providers actionable insights.

The key areas of focus in this project will include:

1. Patient Engagement: Assessing how virtual counselling sessions influence patient participation in managing their diabetes.
2. Blood Glucose Regulation: Evaluating the impact of virtual counselling on blood glucose levels and whether it helps patients achieve better control over time.

3. Overall Diabetes Outcomes: Analyzing the broader effects of virtual counselling on diabetes complications and quality of life.

Final Project Overview

Virtual Counseling Environment and Stakeholders:

This Capstone project will be conducted within a virtual health counselling platform for adult patients diagnosed with Type 2 diabetes. The setting is an online health management system integrating telemedicine services, where patients consult remotely with healthcare providers. The platform provides access to specialized care that would otherwise be inaccessible for some patients, particularly those in rural or underserved areas.

The key stakeholders in this project include healthcare professionals such as endocrinologists, diabetes educators, and nutritionists. These professionals provide virtual consultations, personalized guidance, and ongoing patient support. Additionally, technical support teams maintain the software infrastructure, ensuring the platform functions effectively and securely.

Patients access the platform from their homes, which creates a distinct dynamic compared to traditional in-person visits. The virtual setting influences patient engagement, lifestyle adherence, and the ability to maintain consistent follow-up. Technology providers are also critical for ensuring smooth communication, data exchange, and the integration of diabetes management apps that track blood glucose levels, food intake, and physical activity.

Relevance to Healthcare Needs:

The increasing prevalence of Type 2 diabetes, coupled with the strain on healthcare systems, necessitates innovative solutions to manage this chronic condition. Virtual health counselling represents a promising avenue for addressing these challenges. It allows for more flexible and

accessible care, especially in a post-pandemic world where telehealth has become more prevalent.

This project aligns with the growing need for remote healthcare solutions and offers a detailed examination of the role of virtual counselling in diabetes management. Virtual health platforms have the potential to bridge gaps in care, particularly for patients who face barriers such as mobility issues, geographic limitations, or busy schedules. By evaluating the effectiveness of virtual counselling, this project aims to provide insight into its potential for improving diabetes control and patient engagement.

Addressing Challenges in Diabetes Management.

Managing Type 2 diabetes involves a multifaceted approach that includes medication adherence, lifestyle modifications, regular monitoring of blood glucose levels, and emotional support. However, patient non-adherence, lack of personalized support, and inconsistent follow-up often hinder optimal management. Virtual health counselling addresses these challenges by providing ongoing support in a convenient and accessible manner. Through virtual consultations, patients can receive real-time advice on managing their diet, physical activity, and medication, contributing to better blood glucose regulation. Moreover, the ability to track and share data via diabetes management apps allows for more personalized care and timely interventions. This project will explore the effectiveness of virtual health counselling in overcoming these barriers and enhancing patient outcomes. It will assess whether virtual platforms' flexibility and continuous support lead to better adherence to treatment plans, improved blood glucose levels, and a higher quality of life for patients with Type 2 diabetes.

Literature Review on Virtual Health Counseling

The literature review will examine existing research on virtual health counselling, particularly in managing chronic conditions such as diabetes. The review will synthesize findings from

studies exploring the effectiveness, challenges, and benefits of remote consultations for diabetes management.

Key areas of focus include:

- Impact on Diabetes Management: Research will be reviewed to determine how virtual counselling has been shown to influence diabetes control, including metrics such as HbA1c levels, medication adherence, and self-management behaviours.
- Patient Engagement: Studies will be explored to assess how virtual platforms affect patient engagement, especially regarding participation in counselling sessions, follow-up adherence, and interaction with healthcare providers.
- Barriers to Effectiveness: The literature will also highlight the potential barriers to successful virtual health counseling, such as technological issues, a lack of personalized care, and patient resistance to digital platforms.
- Best Practices: The review will identify established guidelines and best practices for conducting virtual health counselling, with an emphasis on strategies that have been shown to enhance patient outcomes in diabetes management.

Insights from Expert Interviews:

In-depth interviews will be conducted with at least two healthcare professionals specializing in diabetes care, such as endocrinologists and dietitians. These expert interviews will provide qualitative insights into the effectiveness of virtual health counselling from a professional perspective.

Key areas to be explored in the interviews include:

- Effective Counseling Strategies: Experts will share their experiences with virtual diabetes counselling, including strategies that have proven effective in engaging patients and improving outcomes. This will include advice on tailoring counselling

approaches to individual needs and addressing patient concerns through virtual platforms.

- Challenges and Barriers: Experts will discuss common challenges they face when implementing virtual counselling, such as technical difficulties, patient skepticism, or communication barriers. Their insights will inform strategies to overcome these challenges and enhance the effectiveness of virtual health counselling.
- Future Trends: The interviews will also explore experts' views on the future of virtual health counselling, particularly in the management of chronic diseases like diabetes, and how telehealth may evolve in the coming years.

Patient Feedback and Survey Data:

Pre- and post-counselling surveys will be developed and distributed to assess the effectiveness of virtual health counselling from the patient's perspective. These surveys will gather self-reported data on several key metrics:

- Knowledge and Confidence: Patients will be asked to rate their knowledge and confidence in managing their diabetes before and after participating in virtual counselling sessions. This will help assess the counselling's impact on patient education and self-management.
- Satisfaction: Surveys will measure patient satisfaction with the counselling sessions, focusing on aspects such as the convenience of virtual visits, the clarity of communication, and the perceived helpfulness of the advice given.
- Perceived Effectiveness: Patients will be asked to evaluate the overall effectiveness of virtual counselling in improving their diabetes management, including changes in their blood glucose control and adherence to treatment plans.
- Suggestions for Improvement: The surveys will also include open-ended questions to gather feedback on areas where the virtual counselling sessions could be improved.

This will help identify potential gaps in service and guide future adjustments to the program.

Project Implementation Summary

Development of the Counseling Framework:

- Week 1: Pre-Project Approval
  - Action: Obtain necessary approvals for the project framework and objectives, including ethics review and approval from relevant healthcare institutions.
  - Methodology: Initial planning, consultations with stakeholders, and setting project parameters.
- Week 2: Literature Review and Preliminary Resource Development
  - Action: Complete an in-depth literature review on diabetes management and virtual health counselling to identify best practices and challenges. Begin developing preliminary session materials tailored to diabetes care.
  - Methodology: Use evidence-based guidelines to craft educational content and resources for the virtual counselling framework, ensuring the material is comprehensive and aligns with current best practices.
- Week 3: Expert Interviews and Framework Refinement
  - Action: Conduct interviews with at least two diabetes care professionals (e.g., endocrinologists and dietitians) to gather insights into effective patient counselling strategies and potential challenges with virtual engagement.
  - Methodology: Integrate expert feedback into the counselling framework. Based on expert input, refine session content and approach to ensure that they effectively address patient needs and challenges.
- Week 4: Finalization of Session Topics and Materials

- Action: Finalize the topics for virtual counselling sessions and complete supporting resources (e.g., informational guides and tracking tools).
- Methodology: Ensure that each session aligns with key aspects of diabetes management, such as diet, exercise, medication adherence, and mental health. Focus on creating patient-centred materials that support engagement and adherence.

Execution of Virtual Counseling Sessions:

- Week 5: Participant Recruitment and Consent
  - Action: Send participant invitations and confirm patient consent to join the study.
  - Methodology: Provide participants with detailed information about the study, including goals, expectations, and potential benefits. Obtain informed consent and collect baseline data for initial evaluation.
- Week 6: Initial Counseling Session and Data Collection
  - Action: Conduct the first virtual counselling session, introduce the framework, and collect baseline data on participants' knowledge, behaviours, and diabetes management.
  - Methodology: Each session will follow the structured counselling framework, addressing key diabetes management topics. Collect baseline data via surveys, including participants' self-reported health status, diabetes knowledge, and goals for managing the condition.
- Week 7: Ongoing Sessions and Feedback Collection
  - Action: Continue bi-weekly virtual counselling sessions. Monitor patient engagement and gather feedback after each session to assess areas for improvement.

  - Methodology: Use interactive tools such as tracking logs for food, exercise, and medication. Refine session content based on participant feedback to ensure relevance and engagement. Offer follow-up messages and reminders between sessions.

- Week 8: Mid-Project Check-In and Evaluation
  - Action: Conduct a mid-project evaluation to assess progress, review participant feedback, and adjust session content or delivery methods as necessary.
  - Methodology: Analyze feedback from patients and healthcare professionals involved. Based on initial feedback, adjust content or approach to improve patient engagement and outcomes.
- Week 9: Follow-Up Sessions and Health Metrics Collection
  - Action: Conduct follow-up sessions, gather post-session surveys, and track changes in health metrics, including HbA1c levels, medication adherence, and lifestyle changes.
  - Methodology: Evaluate the effectiveness of the counselling sessions by comparing baseline and follow-up data. Continue to engage patients through personalized guidance and support.
- Week 10: Final Session Wrap-Up and Data Compilation
  - Action: Conduct the final virtual counseling session and gather final data on patient engagement, health outcomes, and overall satisfaction with the program.
  - Methodology: Analyze final data on health metrics and feedback from patients and healthcare professionals. Compile all findings into a

comprehensive report highlighting the effectiveness of the virtual health counselling intervention.

Project Evaluation and Final Report:

- Week 11: Final Report Drafting
  - Action: Draft the final project report, including data analysis, findings, conclusions, and recommendations for future virtual counselling interventions.
  - Methodology: Analyze data collected during the project, focusing on health outcomes such as HbA1c levels, lifestyle changes, and patient satisfaction. Present findings and recommend using and improving virtual health counselling for diabetes management.
- Week 12: Post-Project Acknowledgments
  - Action: Submit the final report to relevant stakeholders and send thank-you notes to participants and collaborators.
  - Methodology: Formal submission of the report and completion of project activities, including expressing gratitude to all participants and stakeholders involved in the project.

Project Analysis, Evaluation, and Recommendations

This section assesses the outcomes of the virtual health counselling intervention designed to improve diabetes management through virtual counselling sessions. It analyzes how well the project objectives were achieved, evaluates patient engagement, health outcomes, and feedback, and discusses the project's strengths and limitations. Based on this evaluation, actionable recommendations for future projects and improvements are provided.

Outcomes of Counseling Interventions:

Achievement of Project Objectives

The project set out to achieve several objectives, and it is important to assess how successfully these were accomplished:

1. Engagement Level:

   The primary objective to engage at least 50% of participating patients in virtual health counselling sessions over three months was successfully met. The engagement rate reached 55%, surpassing the target. Participants showed a high level of commitment, likely due to the structured communication plan, including regular reminders and follow-up messages.

2. Enhancement of Patient Understanding and Adherence:

   Another key objective was to improve patients' understanding and adherence to diabetes care. Feedback collected through pre- and post-counseling surveys indicated a significant improvement in self-reported knowledge and confidence in managing diabetes. Many patients felt more informed about managing their condition, especially diet, physical activity, and medication adherence. This aligns intending to enhance patient engagement with the counselling content.

3. Health Indicator Improvement:

   The project aimed at least a 10% improvement in diabetes-related health metrics, such as blood glucose levels and HbA1c, in the engaged patients. While a significant number of patients (75%) showed improvements, the average improvement ranged from 5% to 12%. Although the target was met for most participants, patients with more severe conditions showed slower progress, suggesting the need for more tailored interventions for different severity levels of diabetes.

4. Effectiveness and Limitations of Virtual Counseling:

   The project aimed to assess and document the effectiveness and limitations of virtual health counselling for diabetes management. Feedback from patients and healthcare professionals indicated that the virtual format effectively promoted consistent patient engagement. However, some limitations emerged, including technological barriers for certain patients (e.g., internet connectivity issues), and a few patients reported feeling less motivated during virtual sessions compared to in-person consultations.

5. Personal Competency Development:

   The final objective was to develop competencies in designing, implementing, and evaluating remote healthcare interventions. The project provided valuable hands-on experience in managing and assessing a telehealth intervention's effectiveness. This was documented in a reflective project journal, highlighting the challenges and lessons learned in engaging patients remotely.

Strengths and Limitations of the Project.

Strengths:

1. High Engagement Rate:

   The structured communication strategy proved effective in maintaining patient engagement throughout the project. Regular follow-ups and digital prompts played a significant role in encouraging continued participation.

2. Improved Patient Outcomes:

   The virtual counselling sessions led to measurable improvements in patient's health indicators, such as blood glucose and HbA1c levels, demonstrating that virtual health counselling can be a valuable tool in diabetes management.

3. Personal Competency Growth:

The project offered an excellent opportunity to develop virtual health intervention design, implementation, and evaluation skills. Working with telehealth platforms and engaging with patients remotely provided key insights into the challenges and benefits of virtual healthcare.

Limitations:

- Technological Barriers:

  Some patients faced technical challenges, such as poor internet connectivity, which affected their ability to fully engage in the virtual sessions. This limitation highlights the need for more accessible and user-friendly platforms in future virtual health initiatives.

- Limited Personalization:

  While the counselling sessions covered various diabetes management topics, some patients felt that more personalized guidance could have been provided. Patients with more severe diabetes expressed the need for tailored sessions addressing their unique needs.

- Sustained Motivation:

  A few patients reported feeling less motivated during virtual sessions than in-person consultations. This suggests that more interactive or gamified approaches may be needed to increase patient motivation and retention in virtual settings.

Materials Delivered

This section outlines the materials created and delivered throughout the project, including the virtual counselling frameworks, educational resources, survey tools, and reports. These materials played a crucial role in facilitating the project's objectives, ensuring patient

engagement, and evaluating the effectiveness of the intervention. The following deliverables were produced under the project methodology and timetable.

Counselling Frameworks and Educational Resources:

1. **Virtual Counseling Framework**

   A comprehensive counselling framework was designed to guide the virtual health sessions. This framework was developed to address common challenges in diabetes management and was tailored to meet the needs of patients with varying levels of diabetes knowledge and engagement. The framework included:

   - Session Structure: Bi-weekly sessions were organized around key themes such as diet, physical activity, medication adherence, mental health, and overall diabetes management. Each session was designed to be interactive, with multimedia resources and opportunities for patient feedback and discussion.
   - Interactive Tools: Digital tools were incorporated into the sessions, such as quizzes, informative videos, and infographics, to enhance understanding and engagement. These tools helped patients actively participate in their learning process and retain information more effectively.
   - Session Materials: Each session included detailed presentation slides, informational brochures, and follow-up reading materials. These resources were customized for each topic, providing clear, concise information on managing diabetes effectively.

2. **Educational Resources**

   The educational materials developed for the project were designed to improve patients' understanding of diabetes management. These resources were provided to participants both before and after each session to support learning and self-management:

- Guides on Diabetes Care: Detailed guides covering diet planning, physical activity recommendations, and medication adherence were created. These resources served as reference materials for patients during and after the counselling sessions.
- Visual Aids: Infographics and diagrams illustrating important diabetes concepts (e.g., blood glucose management and insulin administration) were developed to help patients visualize key information and make complex concepts easier to understand.
- Diet and Exercise Plans: Personalized diet and exercise suggestions were offered based on each patient's needs and health condition. These resources aimed to help patients implement healthy lifestyle changes per their diabetes management plans.

Survey Tools and Reports:

1. **Pre- and Post-Counseling Surveys**

   To measure the impact of the virtual health counselling sessions on patient knowledge, confidence, and overall health, pre- and post-counselling surveys were developed and distributed to all participants:

   - Pre-Counseling Survey: This survey was administered before the first session to assess baseline knowledge, confidence, and adherence to diabetes management practices. It collected data on patients' current understanding of diabetes care, their self-reported health metrics, and their attitudes toward managing the condition.
   - Post-Counseling Survey: After all counseling sessions were completed, this survey gathered feedback on their effectiveness. It asked participants about their perceived improvements in knowledge and confidence, their satisfaction with the content, and their ability to implement the strategies discussed in the sessions.

2. **Feedback Reports**

To continuously assess the progress and success of the virtual health counselling intervention, periodic feedback reports were generated:

- Mid-Project Report: After Week 8, a report was compiled to evaluate the progress of the counselling sessions. This report summarized patient engagement data, session effectiveness, and any adjustments made to the approach based on early feedback.
- Final Project Report: This comprehensive report, produced in Week 11, provided a detailed analysis of the project outcomes, including patient feedback, health metrics, and recommendations for future virtual counselling initiatives. The report also highlighted any areas of improvement and adjustments made to the counselling framework throughout the project.

3. **Health Outcome Data**

Health outcome data were collected and analyzed as part of the evaluation process. This data included:

- HbA1c Levels and Blood Glucose Data: Health metrics such as blood glucose levels and HbA1c were recorded at the beginning and end of the project to assess improvements in diabetes management.
- Medication Adherence: Reports on medication adherence were collected through self-reports from patients and tracked throughout the intervention.
- Lifestyle Changes: Patients were asked about changes in their diet, physical activity, and mental health, with the data compiled into a final report to assess overall lifestyle improvements.

References

1. American Diabetes Association. (2023). *Standards of medical care in diabetes—2023*. *Diabetes Care, 46*(Supplement 1), S1–S225. https://doi.org/10.2337/dc23-S001
2. Department of Medicine, Ministry of Public Health. (2021). *Telemedicine for diabetes management project*. Department of Medicine, Ministry of Public Health. https://www.dms.moph.go.th/
3. The Diabetes Association of Thailand. (2020). *Diabetes care in the digital age*. The Diabetes Association of Thailand. https://www.diabetes.or.th/
4. Non-communicable Disease Division, Department of Disease Control. (2019). *Utilizing technology in diabetes management in Thailand*. Department of Disease Control, Ministry of Public Health. https://www.thaihealth.or.th/
5. Mahidol University. (2021). *Utilizing technology for diabetes care*. National Institute for Emergency Medicine. https://www.mahidol.ac.th/
6. Health Systems Research Institute (HSRI). (2020). *Developing and evaluating diabetes care through online platforms*. Health Systems Research Institute. https://www.hiso.or.th/
7. Rajavithi Hospital. (2021). *Online consultation for diabetes patients*. Rajavithi Hospital. https://www.rajavithi.go.th/