Medication Nonadherence Among Adults with Diabetes Mellitus: A Business Plan to Improve Outcomes

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Background and Clinical Question

Type 2 diabetes (T2D) is a global public health crisis
- Over 540 million adults living with T2D worldwide as of 2024
- Projected to reach 1.3 billion by 2050 (Youkhana et al., 2019)

In the United States:
- 37 million diagnosed with T2D
- Additional 96 million are classified as prediabetic (ADA, 2023)

Urgent need for improved prevention and management strategies

Despite effective medications, poor medication adherence persists
- Around 45% of patients fail to achieve glycemic control due to nonadherence (Sendakian et al., 2022)
- Leads to worse health outcomes and high costs
- Estimated $412.9 billion annual cost from T2D complications due to nonadherence (Neupane et al., 2024)

Barriers to adherence include:
- Financial constraints
- Health literacy challenges
- Systemic issues in healthcare delivery

T2D management intertwined with lifestyle, urbanization and unequal access to care (Galaviz et al., 2019)

Primary Goal:

- Increase medication adherence (Medication Compliance Ratio, MCR) from baseline 50% → 85% within 6 months (July–December 2025)
- Intervention involves a mobile health (mHealth) app offering:
- Medication reminders
- Blood glucose tracking
- Personalized health education
- Real-time feedback from healthcare providers
- Rationale and benefits:
- Personalized messages and reminders improve adherence (Sendakian et al., 2022)
- Patient education leads to better self-management and outcomes
- Addresses barriers like:
  - Forgetfulness
  - Lack of education
  - Limited health access
- Aligns with ADA Standards of Care for consistent pharmacologic and lifestyle interventions (ElSayed et al., 2022)
- Supports shared decision-making and patient engagement (Mayberry et al., 2017)

Evidence

Medication nonadherence affects ~45% of adults with Type 2 Diabetes, leading to poor outcomes and $412.9 billion in U.S. costs annually.

- Barriers include cost, low health literacy, and healthcare system gaps.
- Evidence supports mobile health apps with reminders, education, and feedback to improve adherence and glycemic control.
- The PDSA framework ensures effective, adaptable implementation.
- Interventions could raise adherence rates from ~50% to 85% and lower healthcare costs.

Methodology

Population / Eligibility
Adults diagnosed with Type 2 Diabetes
Medication compliance ratio (MCR) under 80%
Excludes patients in existing adherence programs or with cognitive impairments
Practice Setting
Idaho Health Neighborhood Center, Nampa, ID
Serves an underserved population facing financial, cultural, and systemic barriers
Protection of Participants
Follows HIPAA regulations for data privacy
Data encrypted; multifactor authentication used
Informed consent obtained for participation and data use
Printed materials and in-person support provided to address digital literacy gaps

Cost Analysis

- **App Cost:** Estimated $10–$15 per patient/month for subscription-based mHealth app (Shrivastava et al., 2021).
- **Training Time:** 2–3 hours for provider/staff onboarding and workflow integration (Milne-Ives et al., 2020).
- **Implementation Cost:** ~$5,000–$7,000 for initial setup, EHR integration, and educational materials (Chong et al., 2023).
- **App Cost:** Estimated $10–$15 per patient/month for subscription-based mHealth app (Shrivastava et al., 2021).
- **Training Time:** 2–3 hours for provider/staff onboarding and workflow integration (Milne-Ives et al., 2020).
- **Implementation Cost:** ~$5,000–$7,000 for initial setup, EHR integration, and educational materials (Chong et al., 2023).

Design

Intervention: Mobile health (mHealth) app designed to improve medication adherence among adults with Type 2 Diabetes (T2D)
- Features include:
  - Medication reminders
  - Blood glucose tracking
  - Personalized health education
  - Real-time feedback from providers
  - Peer support forums and community engagement

Implementation Approach:
- Guided by the Plan-Do-Study-Act (PDSA) framework
- Phased rollout:
  - **Phase 1:** Planning, stakeholder collaboration, baseline data collection
  - **Phase 2:** App launch, EHR integration, user training
  - **Phase 3:** Evaluate engagement, adherence, gather user feedback
  - **Phase 4:** Continuous improvement and refinement based on data and feedback

Anticipated Results

- **Improved Medication Adherence (MCR) to improve to 85%**
- **Improved Glycemic Control**
- **Reduced Healthcare Costs**
- **Increased Health Literacy and Self-Efficacy**
- **Enhanced Patient Engagement**
- **Scalability and Sustainability**

Future Recommendations

Sustainability Strategies:
- Incorporate ongoing user feedback to refine app features and educational content.
- Establish routine provider training on interpreting app data and integrating insights into care plans.
- Secure institutional support and funding by demonstrating cost savings and improved outcomes.

Project Expansion:
- Expand app functionality to manage other chronic conditions, such as hypertension and cardiovascular disease.
- Integrate behavioral health support to address depression or anxiety often linked to chronic disease management.
- Explore telehealth integrations for direct consultations and virtual monitoring.

Clinical Implications

- Improved Patient Outcomes
- Population Health Impact
- Advanced Nursing Practice Impact
- System-Level Benefits

Conclusion

This project proposes a mobile health app designed to increase medication adherence among adults living with type 2 diabetes from 50-75% in six months to at least 85%, according to available evidence. Such digital interventions have been shown to lower HbA1c by 0.5%-1.2%, reduce hospitalizations, and save an estimated annual savings of $4,000. Idaho Health Neighborhood Center will use this app to assist underserved populations overcome obstacles like forgetfulness, low health literacy, and limited access to care. Advanced practice nurses will find this intervention equips them to use technology to increase patient engagement, personalized care, and chronic disease outcomes. Through ongoing evaluation and adaptation, it will remain effective and could open doors into managing other chronic conditions like hypertension and cardiovascular disease.

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