

## SUSTAINING DIABETES SELF-MANAGEMENT

# Through a social ecological lens

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### Insights from a Qualitative Study on Self-Monitoring of Blood Glucose

Diabetes mellitus is a lifelong condition that requires continuous self-management to achieve optimal blood glucose control. One of the most important self-care behaviours for people living with diabetes is self-monitoring of blood glucose (SMBG) (1). Through regular monitoring, patients are able to understand their glucose patterns and make informed decisions related to diet, physical activity, and insulin self-adjustment (2). However, despite its proven benefits, sustaining adherence to SMBG remains a major challenge among diabetes patients in Malaysia, particularly in primary care settings (3).

This study was conducted to explore the challenges faced by diabetes patients in performing SMBG and to develop a conceptual framework to support sustained adherence. The study is guided by the Social Ecological Model (SEM), which emphasises that health behaviours are shaped by multiple, interconnected levels of influence. These include individual factors, interpersonal relationships, organisational and community environments, and health policies. By adopting this model, diabetes self-management is viewed not merely as a patient's responsibility, but as a shared effort involving families, healthcare providers, healthcare systems, and policy support.

### Challenges in Performing SMBG

There are several key barriers that influence patients' ability to perform SMBG consistently.

Financial constraints remain a major barrier. SMBG requires regular purchase of glucometer strips and lancets, which can be costly. Studies have shown that SMBG devices have poor availability and high prices, which can impact diabetes management (4). This highlights how financial burden can directly compromise long-term adherence.

Knowledge and understanding also play an important role. While many patients own glucometers, not all have adequate knowledge of the correct timing, frequency, and interpretation of SMBG results. Patients who attend diabetes clinics more frequently tend to have better adherence, likely due to repeated education and reinforcement by healthcare professionals. However, adherence to SMBG still remains to be improved, and putting more emphasis on the improvement of individual information, motivation and behavioural skills with patients might be beneficial to maintain better adherence to SMBG in the long-term routine of diabetes self-management (5).



## The “Spinning Wheel” of SMBG Outcomes: AiSmartGula

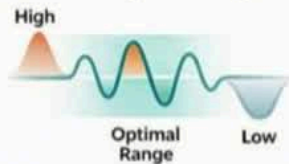
One of the key outcomes of this project is the development of the “**Spinning Wheel**” **conceptual framework**, known as AiSmartGula. This framework illustrates SMBG adherence as a dynamic and ongoing cycle rather than a fixed or one-time behaviour (refer to the figure and video). Positive factors such as improved glucose readings, supportive healthcare providers, family encouragement, and accessible resources assist in the wheel to spin forward and reinforcing adherence. Conversely, financial difficulties, emotional burnout, lack of support, or system-level barriers may slow down or disrupt the cycle.

The AiSmartGula highlights that sustained SMBG adherence requires continuous alignment between individual motivation, social support, healthcare systems, and enabling policies. Addressing only one level is insufficient; instead, a holistic and supportive ecosystem is essential for long-term diabetes self-management.

## Self-monitoring Blood Glucose: Why It Matters

### THE PURPOSE OF MONITORING

#### Maintain a Safe Blood Sugar Range



Monitoring is crucial to ensure blood glucose does not get too high or low.



#### Prevent Health Complications

Unstable blood sugar levels can cause significant complications for those with diabetes.

### THE COMMON CHALLENGE



#### Uncertainty After the Reading

Many patients are unsure about the next steps after checking their blood glucose.

## About the Research Team

This study was led by **Dr. Nur Wahida Zulkifli** as the Principal Investigator, with mentorship from **Associate Professor Dr. Mahmathi Karuppannan**. The project was funded by the **Fundamental Research Grant Scheme (FRGS-EC) - FRGS/1/2024/SS10/UITM/02/26** with a grant amount of RM 30,000 for a duration of **two years (1 October 2024 – 30 September 2026)**.

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